ORAL HISTORY INTERVIEW

of

PETER LOWE

by

RICHARD HARTLEY

23 July 1998

A Career in the Electricity and Gas Industry in Western Australia

1947 to 1988

Prepared for:-

Engineering Heritage Panel

The Institution of Engineers Australia

Western Australia Division

THE INSTITUTION OF ENGINEERS, AUSTRALIA.
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I'm talking to Peter Lowe at the Institution of Engineers Office on 23rd July 1998. Where were you born Peter and who were your parents?

LOWE I was born on 26th January 1927. I was actually born in a Nursing Home in Bulwer Street in Perth. My parents Jack Lowe, and Emily Violet Lowe lived in Harvey but obviously they felt that there were more services available for such a feature in Perth than there was in Harvey or in that area at the time.

RH Your father was a businessman in Harvey was he?

LOWE Yes he owned a general store in Harvey. But we lived a little way out of town on a small farm and orchard.

RH Was he a West Australian born or did he come from somewhere else?

LOWE He was born in Mildura in Victoria and he came to Harvey with his father, my grandfather, in 1898. He set up a farm and orchard there in Harvey, that is my father's father.

RH That was before the irrigation obviously?

LOWE Yes, yes. He planted fruit trees which needed water during the summer but for that he pumped water out of the Harvey River as the farm was on the banks of the Harvey River.

RH So then your father took over that farm and also started his own business?

LOWE Yes. The business was by far the most important means of earning a living. The farm and the orchard were rather secondary at that stage.

RH And did your mother come from Western Australia?

LOWE Yes, she was born a Trigwell and her grandfather came to Western Australia in 1851, I think it was, with the corps of engineers who were sent out from Britain to look after the convicts. He was a sergeant and was based in Bunbury, and as I understand it was in charge of convicts in the Bunbury, South West area.

RH When he retired from the army what did he do?

LOWE He set up a blacksmith's business in Bunbury and also ran a coaching service from Bunbury to places in the general vicinity. One of his runs was from Bunbury to Boyanup where he had a small hotel built or an inn I suppose you would call it. It was called the Anchor and Hope.

RH That's a good traditional name.

LOWE Yes. It still exists actually and is now... well when I last saw it it was some sort of a restaurant.

RH And was that the Trigwell who had the Trigwell's Bridge named after him?

LOWE Yes, I believe so. I'm not completely sure whether the Trigwell Bridge was named after the fact that Henry Trigwell was responsible for its building or whether it was because the bridge led to a Trigwell member of the family's farm. I don't know which was the case.

RH Yes probably the latter I should think.

LOWE Yes it could well be because Henry Trigwell one of his major requirements in the area was to build roads and bridges and that's what the convicts were there for.

RH And his son what did he do – this is your mother's father was it?

LOWE He had a farm in the Boyanup area and so that's where my mother grew up. She then became a schoolteacher.

RH That's how she met your father?

LOWE Yes, that's right, she was assigned to teach in Harvey and that's where they would have met.

RH And you went to school in Harvey for primary school did you?

LOWE Yes, yes. After primary school I went to Perth to Hale School for my secondary education because in those days there weren't very many high schools out of the city.

RH And what date was that when you went to Hale? Was that before the war?

LOWE Well actually right at the beginning of the war, I was at Hale from 1940 to 1945. I lived in as a boarder there.

RH So while you were at Harvey they were building the Harvey diversion?

LOWE Yes, yes.

RH Do you remember that?

LOWE I remember that as a child because a lot of it was taking place before I went to school and so I used to enjoy travelling out with my father and would see quite a lot of these works being constructed. My father managed to obtain the contract to supply both camps where the men lived that were working on the Harvey River Diversion. The Myalup Camp as it was called, had 1000 men under canvas and the Stonehouse Camp had 500 men under canvas.

RH Where was Stonehouse?

LOWE It was about halfway between where the Myalup Camp was and the sea. They were just convenient places. I suspect one of the essentials was that each camp did have a secure water supply and no doubt that was essential.

RH And how often did your father go out there? Did he have someone permanently out there?

LOWE Yes he had a manager at each shop and a small staff. He used to go out quite often. I'm afraid seeing as I was about four or five years of age I can't remember just how often it was but it seemed to me to be quite a good diversion every now and again.

RH Did he have a car in those days or was it a horse and cart?

LOWE Yes, yes he had a car. It was an old Chrysler Tourer and it did very well in the deep sand – that was one of the essentials.

RH Yes driving in the coastal area was pretty difficult in the sand.

LOWE Yes, yes. In the winter time it was fine but in the summer the sand was almost bottomless.

RH So in 1940 you went to Hale as a boarder. Did you enjoy your time at Hale?

LOWE Yes, yes it was enjoyable. No doubt because it was war time many things were different but seeing as that was the way it was when I got there and that was the way it was when I left I don't know what the differences would have been.

RH I suppose you did things like dig slit trenches in the school yard or?

LOWE Yes, yes when we returned to school, the beginning of 1942 after the fall of Singapore, the first job that we were all allocated to was to go up into the bush beside the school by the old Observatory site and everyone had to dig

slit trenches. An interesting sideline to that was that we very quickly learnt that you looked in a slit trench before you jumped into because quite often a snake would fall in there and of course couldn't get out and they would get a little bit upset about that sort of thing.

RH Were you a studious boy?

LOWE Oh I don't think I was any more studious....

RH To of the class or?

LOWE I did manage to get up near the top of the class on a few occasions but I don't know that I was very consistent.

RH What sports did you play? Did you row in those days?

LOWE Yes, that's where I started rowing. Started as a cox and then went onto rowing as I got bigger. I think that was the sport that I liked particularly. We all did cricket in the season and football in the season. I rather liked rifle shooting as well that was I thought a very interesting sport.

RH Very appropriate for the time anyway.

LOWE Yes it was, that's right.

RH And the football and cricket grounds they were in Kings Park?

LOWE Yes that's right. In fact I was up there recently and they have a big sign posted up there that says, that this is Hale Oval so it's still retained its name. For the major sports which – like the first team of football and cricket they would go to a better ground. But the others would be on grounds like that in Kings Park.

RH So Hale School in those days were where the.... just the other side of the Observatory, north of the Observatory?

LOWE Yes, that's correct. That has been purchased by the government and they have a constitutional display arrangement in there apparently.

RH So the Public Works Department didn't have a building there at all, it was all bush?

LOWE That was all bush, yes. The only building near us was the Observatory. One of the interesting things was that the 1.00 o'clock gun was still being operated every day or every week day. And so this gun was or part of a stick of gelignite that was hanging from a frame not far from the boarding house, and at precisely 1.00 o'clock of course it was detonated electrically and told

everyone in Perth what the time was. Usually we were sitting down to lunch at that stage. Until you got used to it it was a bit of an interruption.

RH So it wasn't actually a gun?

LOWE No it wasn't a gun.

RH Detonation.

LOWE No, but it did make a lot of noise.

RH So where would you row from – where was that?

LOWE Yes in those days we would go down to West Australian Rowing Club sheds. The school apparently had an agreement with them to use their sheds. Those sheds still exist today. There was quite a line of them along the shore in Perth. There's only one left and that is the West Australian Rowing Club Shed.

RH So where the ferry terminal is now there were a lot more rowing sheds?

LOWE Yes, yes. Quite a number of them. And the water police had a shed there too.

RH So were you in the head of the river race?

LOWE Yes.

RH Did they have it during the war?

LOWE Yes they had them during the war. It was not very convenient because the Americans had taken over the area around Matilda Bay for a seaplane base and that was exactly where our rowing course was so we weren't allowed there. And there were all sorts of temporary arrangements set up which did cause a fair amount of trouble. But nevertheless one way or another we ran the head of the river. It might not have been ideal but it was run.

RH But not on that course. When you say our course that's the head of the river course?

LOWE Yes the normal head of the river course is through the Narrows or it was in those days.

RH So where was the alternative course then?

LOWE One time it was up very the Canning River goes into the Swan River. The finishing line being just beside the Canning River Bridge.

RH Where the racing course is now?

LOWE Where the racing course is now, yes. But that was a bit of a rush and a scatter to try and have lines set up just for that particular race so I don't know how accurate it was. The next year they tried it along the foreshore from the Causeway to finish at the ferry terminal. That was quite a reasonable course. Unfortunately to get all the distance in you had to go very close to the ferry terminal so as soon as you finished you stopped quickly or you were in a fair amount of trouble.

RH There's very shallow water there I think.

LOWE Yes and that's the real problem because if there's any wind you get the wave action against the wall bouncing back and producing water conditions that are not good.

RH So your final year did you row along that course or the Canning River one?

LOWE In the – actually the twice I was involved in head of the river, one was at Canning Bridge and one was along that other course. In my final year I was rowing in I think it was called the third four or something like that but by then we were allowed to go back to our previous course in the Narrows.

RH So how did you get on head of the river?

LOWE Never won one. No. In my final year rowing in that third four, we won that one.

RH Oh. So before eights came in they were all fours were they?

LOWE No they were the... There was the first eight and I'm not too sure whether there was a second eight at that stage and a third four. I think that must have been the situation.

RH So what made you decide to do engineering? Were there other interests, other alternatives or was it always a....?

LOWE Yes well I think the alternatives I thought about very carefully was whether to go into the same business as my father or to go into engineering. Engineering was something that I perhaps grew up with from the irrigation work that was going on in Harvey. I was used to being around engineers and seeing

what they did. Finally I decided engineering was what I wanted. It was some time before I decided what branch of engineering I was interested in. That happened I suppose during my first year at university.

RH So was there anyone at home that influenced you to do maths and science or engineering and science rather than commerce?

LOWE Yes, I think the Science Master at the time, a Mr Langley he was a very organised scientist and science teacher and the way he went about the work impressed me. I think perhaps he might have laid some foundation stones there. Unfortunately he wasn't there throughout my schooling because the airforce caught sight of him and thought that he was too valuable to be there and took him away for the education of airforce personnel.

RH And during the war time were there people from South East Asia or British people come to Hale School?

LOWE Yes when we went back to school in '42, beginning of '42 there were a number of students that came in that had been displaced from Singapore and Malaysia and Indonesia area. Which was very interesting for us because I seem to remember two brothers came in complete with the tin hats that they had been issued with which brought the war somewhat closer to us than we had thought of in the past.

RH They must have been rather surprised to come to a spartan boarding school from colonial living.

LOWE Yes. As kids you can imagine our reaction when the first time we fronted up for a meal with them we found they had no idea of how to go about having a meal. Couldn't butter their bread and were just sort of waiting around for someone to do things for them. But well kids are very flexible they very quickly learnt.

RH A survival mode sets in.

LOWE There is a survival mode, yes.

RH So where did you live when you were at university, UWA?

LOWE I was living then at St George's College which was a very convenient place. Had the advantage too of course that there were other engineering students there which helped to have someone to talk to and work with.

RH How many others from Hale School took up engineering in your year? Were there several?

LOWE There was only two of us that I can think of, myself and Peter Payne. Peter and I roomed together for quite a bit of the time that we were at St George's.

RH What did you do for your summer holidays? It was a five year course wasn't it?

LOWE Yes. And the summer holidays it was a requirement, I don't know how real it was in the scheme of things, but they always insisted that you did engineering work in your long holidays. And you needed to have a signed statement from your employer which you took along to present to the office when you returned. I never did find out what would happen if you didn't do that but we all did it anyway.

RH They're probably all in the university archives.

LOWE Yes very likely.

RH So the first one you worked on the Harvey Irrigation Scheme was it?

LOWE Yes that was....

RH [unclear] you did.

LOWE Oh just as an engineering student. It was a number of interesting things were on the go at the time. The Public Works irrigation people were looking for the first time at metering irrigation water to farmers. And so they had decided that the meters would either be a Dethridge wheel as they called it or a Venturi set up and so they wanted each of these tested in the field. And so what better people to handle this than a heap of university students so that's what we did for about a month under all sorts of conditions.

RH The Dethridge wheel that was a more traditional one was it?

LOWE Yes, well it was one that was used so much in Victoria. The final result was that the Dethridge wheel was used, and is still used for channel delivered water to farmers but the Venturi was being used in the channels so that you could accurately provide the right amount of water to a channel which might supply a number of farmers.

RH I think they used them in things like the Canning Dam Contour Channel too, a Venturi Meter.

LOWE Yes, yes. Well they have lots of advantages from the point of view that you're less likely to get branches and debris caught in them. Whereas the

Dethridge Wheel if it takes some debris into it and jams it then the water flow is stopped and that's a problem.

RH So where did you stay when you were at Harvey – did you stay at home?

LOWE Yes I stayed at home, yes that was a big advantage of that one.

RH The second year I believe you went to East Perth Power Station. Was that when you first decided to be an electrical engineer?

LOWE Very likely it was. There was a friend had someone he knew at East Perth Power Station and I went along with him to have a look around the station and became very interested and managed to get myself a job there in the next long vacation.

RH So that would be in 1942 would it?

LOWE No, no, we're... It would be '47 or '48, somewhere around there. It's easy to get them mixed up because the long vacation is across the end of one year and the beginning of the next.

RH And didn't your father have something to do with the SEC?

LOWE Yes, he was one of the original commissioners in the SEC. He was termed the Country Consumer's Representative because he had been the Chairman of the Harvey Road Board as it was called at the time for many years. And had also taken a position on the irrigation Board for the State, not just for Harvey as a Consumer's Representative. So that made it a lot easier for me to get to the right people to get myself a job at East Perth Power Station.

RH What sort of work were you doing at East Perth?

LOWE Well being a student you usually ended up with all sorts of odd jobs. They tried to circulate you around the various jobs that were going. I was allocated to the electrical workshop and as such ended up mainly on electrical maintenance and things like that.

RH So at that time had you decided to become an electrical engineer?

LOWE I suspect I more than likely had at that time. Although it wasn't until my final year that I was still doing electrical and mechanical that I finally did my thesis in electrical.

RH So the first two years were the same course for everyone was it?

LOWE Yes.

RH All branches.

LOWE Well the first three years.

RH So you became a cadet with the SEC at the end of your third year was it?

LOWE Yes that's correct.

RH 1949.

LOWE And I was the first cadet the SEC took on as an organisation.

RH Really.

LOWE Prior to that the Public Works Department I think had been the main ones who had employed the engineering cadets.

RH When did the SEC actually set up?

LOWE Oh that's a difficult one.

RH After the war?

LOWE Yes definitely after the war. I think I'd have to look that up. It's about '47 or that sort of time.

RH So it was just the first couple of years they didn't have it sufficiently organised to take on cadets and you were the first one.

LOWE Yes, yes.

RH So after you were taken on you went and did a year away from university doing practical work.

LOWE Yes it was a very convenient time to get the cadetship because to me it didn't matter very much in the previous long vacation work where you worked. But this was starting to get closer to where I wanted to work when I was finished and so it was very convenient to become a cadet at that stage.

RH So where did you work for that full year?

LOWE I was based at Collie Power Station which was just a small power station. Originally it had been built by the Collie Power Company who were a

wholly owned subsidiary of Amalgamated Collieries and they had two coal-fired units of 2.1/2 megawatts each. And of interest was that the boilers were fired with pulverised coal which made them the first pulverised coal boilers in the Southern Hemisphere. Those particular units were commissioned in oh the early thirties, yes something like that.

RH So it was quite an old power station then.

LOWE Yes, yes it was,

RH And messy if you were using pulverised coal?

LOWE Very messy. I learnt a lot about just how difficult it was to contain pulverised coal. What had happened was that an Act had been passed in the State Parliament which was called the South West Power Scheme Act and that was to take over and take over the various little power stations in the little towns around and supply power to them and to rural customers. And the supply for this scheme was to be Collie Power Station so under the terms of the Act the Collie Power Station was purchased from the Collie Power Company and when that was purchased the Commission went ahead and let contracts to add three more 2.5 megawatt units. These weren't pulverised coal they were Spreader Stoker Grate Boilers.

RH And were they putting those in when you were working there?

LOWE Yes. The station was reasonably well advanced when I got there and so it was very convenient. I was allocated to various contractors in turn and as such I learnt a lot about the erection of switchgear, the commissioning of switchgear and then with the turbine contractor I was lucky enough to be allocated one of the three turbines to erect all by myself with a team of people to handle. So that sort of thing is not what you would normally get when you are just a student. Then with the boilers in a similar way I was involved in them and took a real part in the commissioning of the boilers where I learnt quite a deal.

RH So each of these cases was different separate contractor?

LOWE Yes that's right. And of course apart from the working on the new plant I was also involved in the old plant and worked on the usual operating maintenance and efficiency aspects of a coal-firing plant.

RH I suppose being quite an old plant it needed a lot of maintenance and attention?

LOWE Yes, yes. And it was because all these things take a lot of time and of course nothing had been done during the war time period the station was getting more and more heavily overloaded and it was quite a juggle to keep it

going. In fact there was one little arrangement we had, it was because the power station had belonged to the coal company previously we were - the power station people were required to blow a steam whistle for them to start work and knock off for lunch and finish work and all that sort of thing. Quite commonly during the morning the load would build up and up and up as all the mines were trying to get the last load of coal out of the mine before lunchtime. Quite often we'd get into trouble at that stage, the load would get too much so the technique was to race out and pull the whistle to knock them off five minutes early and we'd just get away with it. There's more than one way of doing these things isn't there.

RH I don't expect the coal company's managers were very pleased.

LOWE No, more than likely not they would have suspected that we had trouble with the clock or something like that at the time.

RH So the power station was mainly serving the Collie Coalfield?

LOWE Yes that's right. It wasn't interconnected with the metropolitan system and in fact it didn't go far except just locally around Collie.

RH What did Bunbury have then?

LOWE Bunbury had their own little diesel power station and as did most of the towns in the South West.

RH So after that you were also involved in inspecting coal. Was that in the same period?

LOWE No that was a little later. I did get involved at that time as a student, as a cadet. The East Perth Power Station wanted to have a 2,000 ton sample of a particular type of coal to test it because it was a troublesome coal with impurities. So I got the job of supervising the removal of this coal from underground and its trucking to Perth to make sure it was kept separate from all the other coal so that it could be part of this test.

RH Was that part of the Amalgamated Collieries operations – the Co-operative Mine?

LOWE Yes it was.

RH There was virtually only Amalgamated Collieries....

LOWE No, no there was Amalgamated Collieries and Griffin Colliery.

RH Just the two of them.

LOWE Just the two of them in those days.

RH Amalgamated had most of the government contracts.

LOWE Well they both had government contractors but Amalgamated had the lions share. It was convenient having this little testing job on the Co-operative Mine because the power station was right beside it and that's where the power station took its supply of coal.

RH So there were concerned about the quality of the coal that was going to the new part of Collie Power Station were they or was this for East Perth?

LOWE No it was just for East Perth.

RH Oh.

LOWE This was a part of the Co-op Mine, Co-operative Mine that had been worked previously but the coal had given so much trouble that it had been closed down. Then after the war there was such a demand on coal that they wanted to see if they could open it up again. So that's why it was agreed that if they produced a sample it would be tested and then a decision would be made as to whether they would open it up.

RH Did they do that in the end?

LOWE Yes they did, the mine was opened up and that was used.

RH So then you went back to university for your final year?

LOWE Yes. Yes all of....

RH Did you find it a bit irksome going back to your studies after having spent a whole year in the field?

LOWE No, I thought it was very good. I went back with renewed interest because a lot of what I was doing made a lot more sense than it had previously, and I enjoyed that quite a lot.

RH So the final year passed all right with you. Oh I haven't asked you about your rowing at university. Were you involved in that?

LOWE Yes, yes I was involved at university and rowed in a number of their crews. I never got to the point of representing the university in their top crew but certainly in some of their other crews. I did stroke the St George's College Eight while I was there and one year was Captain of Boats at university.

RH So St George's College had their own Eight did they?

LOWE Yes, yes. And there was each year there was a competition - I've forgotten what the name of the cup was - between University, St George's and the University Hostel. There were three eights and the year I was stroking it I was very pleased we won it.

RH So where was the University Hostel?

LOWE That's where – what are they? I've forgotten what they call it now but it was in those days it was the accommodation that the Americans built for the seaplane base. It was in two sections with the dining facilities in the middle and after the war one section was set aside for males and one set aside for females. It was called the University Hostel but that was all bulldozed later and the new building put up which at the moment I can't recall what it is called.

RH Was that the other side of Mounts Bay Road, in actually the Crawley Campus?

LOWE Yes it's opposite the... No it's the same side of the road as St George's College and just about opposite the front of the university. I think the new building is called Currie Hall.

RH So St George's College was the only residential college, called a college at the university then?

LOWE At that time, yes.

RH So the present ones came later.

LOWE Yes.

RH How many boys or men stayed at St George's College?

LOWE I think it was oh something like 80 or 90, it was less than 100.

RH So what was undergraduate population at the university then?

LOWE I couldn't answer that. I know from an engineering point of view we started first year with 120 which was quite a huge number for them in those days because of course there was a lot of ex-servicemen coming back from the war went in. By the time I graduated we were I think 40 or 45 so there was a fair culling took place on the way.

RH Yes that was 40 to 45 in all sections of engineering?

LOWE Yes, yes.

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RH So how many branches did they have on those days?

LOWE There was civil, mechanical and electrical.

RH Just the three.

LOWE Just the three, yes. But really they didn't divide it up in that way they were merely subjects and so depending on what area of engineering you were working towards you took certain subjects they were allocated to you. But these days there's an electrical school and a mechanical school and so on but not then.

RH So 40 new graduates came... graduated in your year.

LOWE Yes.

RH So how many of those went into the SEC? Were you the only one?

LOWE I don't know whether there was more than just me. There might have been. There might have been twice that, it might have been two.

RH As a cadet were you paid while you were at university?

LOWE No, no, you were only paid while you were working. It was a fairly small amount of money which as a rule hardly paid for your board let alone anything else. But that's the way it was in those days.

RH How many years were you a cadet?

LOWE Two years and I think I signed up – in signing up as a cadet I was required to do a third year with them after I'd graduated before the cadetship could be cancelled.

RH So they really only provided you with experience while you were working for them.

LOWE Yes that's right. A number of years later the cadetships changed to that that they paid you while you were at university as well as when you were working.

RH So you went to work full-time at the SEC after you graduated in 1952?

LOWE Yes. Yes the short time I started work again in December '51 and because the degrees had not been conferred at that stage – in fact come to think of it I hadn't finished my thesis then. I was put on as an engineering assistant

which was the normal thing and then as soon as the degree was conferred in March the next year my title changed to Assistant Engineer. Mind you it wasn't only the title that changed it was the amount of money you got that changed as well.

RH What did you do your thesis on then?

LOWE I did it on Alternating Current Protection which in those days were all electro-magnetic devices, none of these electronic arrangements as we have these days.

RH Was that a major problem at the power station in those days?

LOWE It wasn't a major problem but it was something that very few people knew anything about and so I was rather interested to get involved.

RH So what were the main problems to protect a....?

LOWE Oh this was protection of various circuits like well in the power station itself protecting the alternators against faults both internally and externally. The cables and transmission lines that led off they all had to have protective devices on them. Motors and things like that had to have protective devices and transformers. The point I was particularly interested in was the science of calculating the settings for these and to do that I set up a simulated system with winding coils and reactors and capacitors and things like that which turned out to be very complicated. I don't know how accurate it was but it certainly kept me amused. They did give me my degree so it couldn't have been all wrong.

RH So all your experimental work was done in a department to that?

LOWE Yes, that's right, yes. Yes they had an electrical workshop there with technicians working in it and so you could do things yourself or if you weren't capable of doing that particular thing you could have people do it for you as long as you've calculated all the requirements, laid those down.

RH Where were all the lecture theatres and other facilities in the Engineering Department in those days?

LOWE Well see the Engineering Department was built around the old homestead there and there were lots of the lecture theatres were rooms in the homestead. Then there was one main hall that was built which was two-storeyed and it had the biggest lecture theatre in that on the ground floor. Then upstairs it had quite a big area that was used for tutorials and things like that. Then they had a number of Nissan huts around that had been built by the Americans for the

seaplane base and we used those up as well. So it was a fairly Heath Robinson set up.

RH So none of the existing buildings for the Engineering Department had been started then?

LOWE No, no.

RH That was the other side of the oval.

LOWE That's right, yes.

RH So what did you think of your lecturers and professors in electrical engineering?

LOWE Oh they varied but we had a number of very good ones. Professor Blakey who lectured us in structures and structural engineering he was particularly good. He was one who had not always been an academic, he had been out in the field as a consulting engineer. His lectures were always very interesting because he'd run through the theory with it and then he'd usually finish up by saying, "Well now if you're on a building site this is what you've got to look for." Which is all good stuff.

RH So when you were sent down to Collie again in 1952 did you expect that or?

LOWE Did I?

RH Did you expect to go back to Collie when you were full-time?

LOWE Yes. Yes it was all arranged that that happened and in the meantime of course, in the year quite a number of things had changed. The new plant was all in service at that stage and it was very interesting getting involved again to knock the bugs out of the new plant and that sort of thing.

RH So what sort of... what did you do as far as preparing efficiency requirements and things like that?

LOWE This was measuring what the efficiency was in the plant as it was operating and then working out where the losses were taking place that shouldn't have been taking place and then doing something about it. That is not always easy to do when the plant is under considerable stress because of you know the amount of load it was carrying. But an amount was achieved.

RH So even with the new units it was still under stress was it?

LOWE Well that perhaps happened a couple of years down the line but as we were bringing new plant on it seemed to me it was only just that it got on in time. I think with all these things you usually find you are fighting to get the last little bit in place before it is too late.

RH And was it there that you worked on the operating manuals or so?

LOWE No, not at Collie, no that was later. At Collie one of the interesting things was that the original units, the two pulverised fuel fired units I mentioned were built in the early thirties. Now they were generating at 40 cycles and they were supplying the town and area around and the mines at 40 cycles. Prior to that the town had been supplied with direct current from a little power station no doubt run by the local authority and so the Collie Power Company didn't bother to convert any appliances they merely supplied some DC and that's the way it was. So when I got back after completing my degree we had to set about converting the appliances in the supply area to the 50 cycles AC that the new plant generated at and which meant converting 40 cycle to 50 cycle. Converting DC units to 50 cycle AC and then of course finally converting the two old units themselves to 50 cycle operation which was a very interesting procedure.

RH So it must have been a bit of a nightmare having the three systems altogether.

LOWE It was yes, yes. So this was part of this plant stress business because you just couldn't get it all together. Like we would have started off with a three units with 50 cycle generation being far more than ample to supply anything that we had for it, and the other two units on 40 cycle were working very hard. Then we'd get to the stage where one unit on 40 cycle could handle the amount of 40 cycle that was left and then we'd have to work on the second 40 cycle unit and convert it to 50 cycle operation. Then we were just down to one unit with no standby at all and we had to then do the last of the conversion very very quickly so that we could get rid of all the 40 cycle, then we had four units available on 50 cycle and a bit of time to convert the last unit.

RH So what were priorities in conversion – was the coal mines first?

LOWE No, we took it.... It was pretty well decided by where the power lines went and so you had to be able to supply the.... You had to arrange that each area could be supplied with 40 cycle and 50 cycle in such a way that you could move through and do your conversion. That had some difficulties and naturally temporary lines and things like that had to be constructed.

RH It must have been very interesting and very complicated.

LOWE Yes it was like a jigsaw puzzle.

RH So who paid for the consumer's conversion?

LOWE The SEC.

RH Did they. Oh that must have been very expensive.

LOWE Yes it would have been but of course it would have been expensive not to too. It had to happen.

RH So was it paying for the wrong decision in the early days?

LOWE Yes that's right. Well in those days finding out what the right decision was going to be would not have been as easy. Hindsight is a wonderful thing.

RH And did this involve only putting in transmission lines in?

LOWE Yes they weren't associated with the conversion but they were associated with the South West Power Scheme because that was up and running now very quickly. And so we had a high voltage line running from Collie across to Bunbury, and then from Bunbury it radiated out to other towns through to Boyanup to a butter factory there and then running north up to Waroona. Then we ran another high voltage line through to Bridgetown to supply timber mills out in that area. Then the mines started to move out from Collie quite a deal and with the Griffin Coal Mining Company moving out to the Muja area and so high voltage lines had to go out to supply those loads. Then a little later another high voltage line all the way down to Albany to pick that up and the towns like Wagin and Narrogin and those places on the way.

RH Was Bunbury Power Station built then?

LOWE No, Bunbury Power Station didn't operate until 1957.

RH So Collie was providing power for the whole of the South West?

LOWE Yes, yes with no interconnection. So it was a one stop shop as it were, there was no back-up. Consequently towards the end that is towards the point where we were working to get interconnection with the metropolitan area the loads were getting to the limit of what could be carried. There had been two 1 megawatt diesel engines that had been installed during the war at Midland Workshops and we managed to get hold of those and install them temporarily and integrated them with Collie Power Station and that helped us quite a lot.

RH So there was no question of the old units at Collie Power Station being pensioned off at that stage. They still had to work hard.

LOWE They still had to work very hard, yes.

RH This is where you were involved in inspecting coal?

LOWE Yes that's right. The SEC was generally speaking all plant operated on coal and seeing as I was stationed in Collie I was given the job of the Commission's Coal Inspector which was very interesting, it was a different angle. It had its points because of course the contract with Amalgamated Collieries was a cost plus contract which is a rather a funny thing to try and administer in any way.

RH Yes if you were too strict the cost of the SEC would go up.

LOWE Would go up, that's right, yes. It was a little different.

RH On the other hand if you weren't strict enough the cost would go up because the power stations wouldn't be working efficiently

LOWE That's correct. So somewhere in the middle was the place where you had to work.

RH Did you get pressure from the Colliery on your inspection results.

LOWE Yes. Yes there were a few incidents. But one that I remember particularly was - involved the Black Diamond Open Cut. And there, because of the peculiar set up in the coal seam once in a while they would find a clay pug inclusion into the coal seam. And of course the fellows weren't being particularly careful and the clay would end up in some of the coal. I complained to them about this and they didn't respond and so I took the view that well I was going to sit at loading point where it was loaded into wagons and keep rejecting all the coal as it came through until they changed their habits. This went on for a day or so and then the Superintendent for Amalgamated in Collie came out and had a word with me and said that if I didn't stop this sort of thing he was going to report me to the General Manager. I told him I wasn't going to stop it until he sorted his men out. But it worried me quite a deal so I got a message through to head office about what was happening and the message that came back was the quickest way I can get into trouble is if I stop rejecting coal.

RH Who was the General Manager then?

LOWE That was Frank Edmondson. He was, well I suppose I was going to say he was a little different but we're all a little different. He was one who started very early in the morning, and I was responsible directly to him as far as coal was concerned and my starting time at the power station was 8.00 o'clock but if I wasn't at my desk at quarter to eight when he rang there was always trouble.

RH So did the collieries try and put the clay at the bottom of the truck and the good material at the top or...?

LOWE No there was nothing like that done. In fact I think they were so relaxed about it they couldn't have cared less. Whatever came out the other end that's what went in.

RH So where did you live when you were at Collie?

LOWE We had a house on the site. The Collie Power Company had built these houses for the senior staff at the power station and I was in one of them. I know at the time there was a lot of discussion in various things that I'd read that the old idea of living on the site was quite wrong for all sorts of reasons and a couple of times I had an experience of this where I could have been sound asleep and then I suddenly find I'm completely awake and sitting up in bed and wondering what's wrong. Then about a minute or so later the phone would ring from the power station saying they were in trouble. Obviously sub-consciously I'd heard these alarms going and had woken up. It struck me then that I think they were right, it was not a good atmosphere to relax in.

RH No, it wasn't good for your sleep I shouldn't think.

LOWE No.

RH So how many of you lived in the house on site? You weren't married then?

LOWE Yes, I was married.

RH Oh yes, oh.

LOWE Yes. Well all the shift engineers so there would be four or five of those and when I was an Assistant Engineer there was myself and the Engineer in Charge were the ones that were on site.

RH So your wife lived on site as well?

LOWE Yes, yes.

RH When were you married then?

LOWE We were married in '52 and we had our first child when we were still there. It's one of the hazards of living beside a coal-fired power station when you hang the nappies out on the line.

RH Oh yes, I hadn't though of that.

LOWE A bit of a problem.

RH It must have been. I bet your wife didn't appreciate it.

LOWE Yes.

RH Was she a Perth lady?

LOWE No, she was from Collie. She was a schoolteacher and....

RH Seems to run in the family.

LOWE Seems to run in the family, yes that's right.

RH So your wife was teaching in Collie and she actually came from Collie itself.

LOWE Yes that's right, and obviously that's where we met. The various things that we were interested in at the time there was the local Badminton Club and things like that. One of the interesting past times was going on the marron trips which would be up to Wellington Dam very often. A marron run like that was... all you needed was quite a large amount of beer and a number of nets to catch the marron and something to cook them in, and it was usually a good evening.

RH So after 1955 you were made the Engineer in Charge of the Collie Power Station?

LOWE Yes that was correct.

RH You still stayed on the site?

LOWE Yes.

RH You didn't move away?

LOWE Yes, stayed in the same house. This was when the previous Engineer in Charge had retired and I took over from him.

RH You must have been quite young to be in charge of a power station?

LOWE Yes, I was particularly lucky that this opening occurred at that time because you don't usually get those opportunities.

RH So the South West Power Scheme was gradually expanding during that time?

LOWE Yes, and the interconnection actually with Perth actually took place in the year that I was at South Fremantle Power Station – the following year, that is the year of 1956. So up until the time I left Collie it was still an island power station as it is termed.

RH But gradually taking on more country areas.

LOWE More and more country areas. Well by then it was handling as far south as Albany and as far north as Waroona.

RH So you put some extra units in to take this. Were these the ones that came from Midland?

LOWE Yes that's right. The two 1 megawatt diesel units. They were very useful because they were high speed diesels and you could bring them on-load very quickly. Not only were they useful for meeting peak load but if you had a bit of plant trouble you could get some relief very quickly to avoid having to reduce load.

RH And you're still using pulverised coal on the old units?

LOWE Yes that's right, yes they were still....

RH They didn't think of using pulverised coal elsewhere?

LOWE No the new units didn't use pulverised coal. It was most unusual. I've never seen boilers as small as this on pulverised coal. I don't know why they did it in those days. Of course the technique was very new and perhaps they didn't realise just how complex it was in such a small unit.

RH But you had three different types of units in the same station then, you had diesel, pulverised fuel and ordinary coal.

LOWE Yes that's right, yes.

RH That must have made for complications?

LOWE Well they all do slightly different things and it is a complication.

RH Did you have a few dramas at Collie with high loading?

LOWE Yes, yes. I don't remember any that were particularly bad but storms and things were always a problem because when you are supplying such

a huge area you are open to that so often. There was one time I remember having an unusual problem and that was I was telephoned about oh 2.00 in the morning that the high voltage switchyard had tripped off completely. So I went out to have a look at it and couldn't see anything wrong at all and so I asked the charge engineer to close the circuit breaker and I'd have a look, see what happened. As soon as he closed the circuit breaker there was a flash over and it went straight out again. I suddenly realised what was happening. There was thick pea soup fog and very little wind but what wind there was was bringing all the smoke directly over the switchyard and it was just coming down in amongst all the fog and obviously causing....

RH This morning I'm talking to Peter Lowe for the second session of our Oral History on 22nd March 1999.

The end of our last session we were talking about the Collie Power Station and you came out in the morning and the smoke and fog were obviously causing some problems.

LOWE Yes, the switchyard had flashed over and the circuit breakers had opened and I found that with the thick fog that was over the switchyard and the smoke from the stack was just drifting in and being absorbed into the fog. I assumed it caused a conducting liquid to form on the insulators and that's what caused them to flash over. I've not seen that before or since but I think that's what happened on that occasion.

RH It's an unusual meteorological problem?

LOWE Yes that's right with exactly the right conditions just happened to apply which luckily doesn't happen very often.

RH So at the beginning of 1956 you finished at Collie Power Station and were transferred to South Fremantle.

LOWE Yes, I was transferred to South Fremantle Power Station as the Efficiency Engineer. And this was important in my experience because although I'd had a very wide experience at Collie Power Station it was all with very small machines and now I was stepping up into the bigger league they were 25 megawatt turbines each one fired from a pair of boilers.

RH Ten times the size the units were – the Collie ones.

LOWE That's right exactly, yes, yes. And getting into the more shall we say commercial size of power stations, the Collie one was a lot smaller. Mind you there's nothing like a small unit to get experience on because you are required to get into the smaller units in a lot more detail in a small station than you are in a

big one where things are sub-divided into categories. You don't get a shot at all of them.

RH So as Efficiency Expert you had to look at various [unclear] of it didn't you?

LOWE Yes as Efficiency Engineer I had to take an interest in all aspects of power station operation and maintenance as far as it comes to that because unless the maintenance is right the efficiency is not right. I know from a maintenance point of view one of the jobs was to keep a very close eye on the coal pulverisers because the fineness of grind of the coal had a marked effect on the efficiency of the boiler but then.... And of course the maintenance on the pulveriser affected the fineness of the grind. But then they were expensive machines to maintain so there was a balance there that one had to strike. I suppose what it was is conserving dollars and that's really what we're all about.

RH So there was more mining equipment, the pulverisers than normally expected.

LOWE I daresay well that's what you see in mining areas. But these were units that were very much developed for power station use and of course they had to be tailored to the type of coal they're grinding and that's important.

RH Coal didn't have to be kept under water or anything like that though?

LOWE No, instead of keeping it under water what we did, we had a coal storage area and the coal that was in that storage area was moved out around the heap with a small bulldozer and it was a requirement that they laid this coal down in about oh six inch layers and made a point of going back and forth over it quite a bit to consolidate it. We calculated that we could avoid spontaneous combustion in the coal if the density in the heap was above a certain level. So we would regularly test to make sure this was being achieved. I suppose it's the same as putting it under water, all you're doing is excluding the air isn't it.

RH You didn't have any problems with the coal combustion?

LOWE No, not problems. It was always there, it was something that you had to watch continually and some of the edges of the heap would invariably give trouble and there was always portable sprinklers around to keep cooling it and moistening it and that sort of thing.

RH Who was the plant manager at South Fremantle when you were there?

LOWE That was.... Gee that's a tough one. I'm trying to remember. A Mr Brackenridge, and a very very nice chap. He grew up at East Perth – when I say grew up, he moved up through East Perth and then came from East Perth to South Fremantle as the, well they called them Station Superintendents then. His background was as a Marine Engineer but he was both a very nice chap and a very good operator shall we say.

RH So then you learnt after a year that you were lucky to be the new Bunbury Power Station Superintendent?

LOWE Yes, yes, that's right. That allowed me time... I was told about this in about August and it allowed me to prepare for Bunbury whenever I had the opportunity. And that was very useful collecting information and getting clear in my mind the sort of things that needed to be done and the sort of administrative hierarchy that I needed in place and that sort of thing. So that once I got down there at least those routine things didn't have to be thought through as much.

RH They were going to be similar sized units as South Fremantle were they?

LOWE Just a little bit bigger, they were 30 megawatt units instead of 25 but that doesn't make a lot of difference. Actually they were different turbines from the point of view that at South Fremantle they were turbine impulse turbines built by Metropolitan Vickers and the Bunbury ones were reaction turbines built by CA Parsons. The theory is different but the practice is not terribly different.

RH I believe you went to South Australia to research some stuff to Bunbury. What was that?

LOWE Yes I spent a week at Port Augusta Power Station because they had very similar plant to what was going into Bunbury. They had the Parsons 30 megawatt turbines but also their boilers were built by Riley Dodds and their pulverisers which were quite different from what I'd been involved with before, they were known as Attritor Pulverisers and although the type they had in Port Augusta was not precisely the same as Bunbury they were very similar and had similar problems.

RH Leigh Creek coal was it?

LOWE Yes that was Leigh Creek coal and when you come back to work with Collie coal it's a real pleasure. Leigh Creek is dreadful stuff.

RH Is it? And you actually selected the staff for Bunbury?

LOWE Yes I think that was the thing that interested me particularly was that I was starting the station off from scratch and so the staff had to be

interviewed and selected and operator training, manuals and things like that had to be prepared – at least temporarily. And this of course, the operation is all in conduction with the contractors they bring in commissioning engineers and we worked with them because after all they were the specialists.

RH So it's an advantage for a Station Manager to be on the spot while the units are being put in?

LOWE Yes well what we did was it was a joint process. We used our operators as well as the contractor's operators – they worked together in the same way as I worked directly with their commissioning engineer so it was a joint effort. Everyone was learning as they went.

RH I think you had trouble with one of Parson's turbines didn't you?

LOWE Yes that was early in the piece. It was the Number Two Turbine. When the first turbine came on line seeing as that was the only output we could have was up to 30 megawatts and it was the cheapest generation in the system.

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LOWE On for as many hours as it could stay on and we developed many systems to see just how many hours we could keep it going and make the maintenance very fast when it had to be.

RH So at that time the South West Scheme was...

LOWE It was interconnected.

RH ....was a metropolitan one.

LOWE Yes that's right, that was interconnected in the middle of 1956. Anyway when the second unit came on line there had to be an amount of cycling – we could only keep one unit on over night so every night one unit came off and was brought on again in the morning. This cycling showed up the problem. Quite early in the piece there was a leak developed in the high pressure cylinder of the number two turbine and when it was lifted by the contractors because it was still under guarantee it was obvious that the cylinder had been distorted through thermal stresses. There were arguments about whether our operators had been following the makers instructions or not on the operation of machines. I was sort of accused of not doing the right operating procedures and so I was quite sure that we had followed it but I was equally very suspicious that their methods were correct. So using their fundamental requirements of rate of rise of temperature and things I had thermo couples embedded in 20 or 30 places in the machine and we did quite an amount of testing. That proved that in fact the Parsons method of running up these machines particularly when they were in a warm condition was entirely wrong, to the extent that for instance a warm machine run up they recommended a 20 minute run up. We found that the ideal was four and the 20 minute one exceeded many, many temperature requirements in the machine and obviously caused this distortion. After that we stuck with the system of run up that we had devised and there was no further problems. It's interesting to realise that 40 years later those machines are running just as well as they ever ran before so it says something for the system that we developed.

RH There's quite a big difference between four and 20.

LOWE Yes, that's right. Well in fact what was happening was the warming up process was being reversed and you had a cooling down to start with and then a warming up and the whole thing was quite wrong.

RH As long as we're talking about starting up – you mentioned something about a black start – what does that mean?

LOWE Yes at this stage in the development of the power system we realised that at East Perth Power Station they had some stoker fired boilers in the early days, and if the whole system shut down you are able to start up a stoker fired boiler and get a turbine running and gradually you can bring the other

machines in. But there's no way that a power station like South Fremantle or Bunbury could be started without an electricity supply being available to it. So we decided that we would develop a system whereby that could happen. As usual there is never any money for these things and so we were able to get hold of a, I think it was a 600 horse power diesel generator which we installed and it was just big enough to start our circulating water pumps. Mind you the poor thing did a big cough when the circuit breaker was closed but it managed it. This meant that we could be operating and then shut down and with no power available to the power station except this diesel which we would crank up we could be back on load within 15 minutes which we thought was a good little effort and for not a great deal of expenditure.

RH This would be in emergency situations where you had no power at all from anywhere?

LOWE Yes that's right.

RH Was it ever used?

LOWE I think it was once, not while I was there, but I think it was once. That could have been when Cyclone Alby went through.

RH Oh yes.

LOWE I think that might have been the only occasion. Of course in later years we installed a gas turbine at Kwinana Power Station so that it could be completely self-contained. Now of course the system has a lot of gas turbines in it and so we gain a lot of security from that.

RH Oh when you were talking about training I didn't ask you where you recruited most of your station operators.

LOWE Well many of the more senior ones they came from South Fremantle where usually in those days there was a turbine driver and a turbine driver's assistant, a boiler controller and a boiler controller's assistant. So many of the assistants from South Fremantle moved up to become the controllers and that at Bunbury and that worked very well. The ones that wanted to move were very keen and they were a good team. Then of course we had to get the assistants and they came, I suspect mainly from the timber industry and some from the gold mining industry.

RH They'd all been experienced on steam?

LOWE On steam, yes. They all had to come with a Steam Ticket but that experience might come in all sorts of ways.

RH Did any come from sea engineers?

LOWE Yes. Well on the charge engineer side of the business, that is the step higher than the turbine drivers and boiler controllers they were from the sea. Although again there we had several of the boiler engineers from South Fremantle moved over to Bunbury as charge engineers again a step up but some came directly from sea.

RH Also was there a problem in finding housing for them in those days?

LOWE Yes, yes. It was quite a problem and the SEC overcame that by doing a deal with the Housing Commission to provide, I think it was 40 or 50 houses, something like that for the start up. Then a continuing number after that. So we all moved in, we were quite a little community there to start with. Gradually over the years of course people bought their own houses and blocks and that sort of thing and moved out. But at the start up we were quite a close knit community.

RH So it was all around the power station?

LOWE No it was quite a long way from the power station.

RH [unclear]

LOWE In a Housing Commission area in Bunbury.

RH Where did you live yourself in the end?

LOWE We moved closer to Bunbury town itself and strangely enough right up on top of a sandhill we had a magnificent view from there but people were always commenting that the thing that was in the middle of the view was the power station. Mind you it was quite a number of miles off but it was a good view.

RH That's one of the most visible things in Bunbury.

LOWE It is.

RH From anywhere isn't it.

LOWE It is yes. I could always tell by the type of smoke that was coming up the stack just what was going on inside and whether a quick telephone call could sort a couple of things out.

RH And so had you any children when you were there?

LOWE Yes, actually with our family we sort of moved around a bit. Our first child, our first boy was born in Collie and our second was born when we were in South Fremantle and our third was born in Bunbury. If there's a story behind that or not but that's the way it was.

RH I suppose your wife is glad not to be actually living on the power station site like she was at Collie?

LOWE Yes, that's right, yes. I think it had mainly disadvantages, not many advantages.

RH So you were ten years at Bunbury and then I think you were told you were likely to be going to Kwinana.

LOWE Yes that's right. It was unofficial but you know it was one of these unofficial things that you could start working with and I started to develop the operating procedures and training methods that I thought should apply because the boilers that were going in to Kwinana were going to be oil fired because in those days – this was before the Middle East upset oil was very very cheap and by far the cheapest fuel that we could use. So we were going to 120 megawatt turbines which was twice as big as the Muja 60 megawatt ones which we were operating on and were oil-fired which we had not done anything in this high pressure high temperature oil firing before. So in fact there was no high temperature, high pressure oil-fired boilers – I don't think of that size in Australia in those days.

RH None at all?.

LOWE I wrote to a power station group on the West Coast of America and they were very helpful, they sent me out manuals and lots of stuff and I was able to develop some quite good training ideas and things through their help.

RH This was before the actual contractors had been chosen for it?

LOWE They had been chosen, yes, yes. But I wanted to... I knew I was going to get any amount of stuff from them but I wanted to go elsewhere.

RH Some operator's point of view?

LOWE Yes, that's right, yes. Have an unbiased view.

RH So what's it when you say high temperatures, what sort of temperatures are you talking about?

LOWE Well they were to be over 1000 degrees Fahrenheit compared with 900 degrees at Bunbury. And the Bunbury was 600 psi, 900 degrees F and

Kwinana was to be I think 1000 and 1000 – something like that. But the significant thing is that around that temperature you were nudging up against the limits of the metallurgy of the steel in the super heaters so that was the thing that one had to watch very carefully.

RH So while you were in the midst of preparing to go to Kwinana you got a promotion as Gas Engineer at Head Office.

LOWE Yes.

RH So on October 1967 you were transferred to become a Gas Engineer. Was that a surprise or?

LOWE Yes it was a surprise. The Gas Engineer was Ross McLean and he'd been there for quite a number of years and he decided to retire and applications were called. I applied for it because it was a considerable step up for me and much to my surprise I got the job. So things changed all of sudden from thinking about being station engineer at Kwinana to becoming in charge of the Commission's gas undertakings.

RH The next few years were quite an exciting time in the gas industry.

LOWE Yes.

RH What were the main things that were happening then?

LOWE Well it was a good time for someone to come in who was a bit outside the industry because the industry was changing from entirely coal-based gas manufacture over to catalytically reformed petroleum feedstock manufacture. Really that was....

RH A mouthful.

LOWE A bit of a mouthful yes. That is very much the same as operating a power station. Then flowing from that of course it wasn't long before we moved into natural gas itself so they were all new things. The other things that changed at the same time was PVC piping was becoming much more acceptable. We changed from our cast-iron gas mains in the street which had been the usual thing for about oh I don't know 100 years, into PVC. So it went on, it was a major change all round.

RH Which came first the chicken or the egg as far as the manufacture of PVC pipes? Were they tooled up to make large quantities of gas main?

LOWE Well I think really what happened was they were making PVC pipes in Western Australia and these were being used for other things. It was very new

in the business. However when we changed from coal gas based, gas manufacture to the catalytic reforming that allowed us to look at PVC because the coal based gas has some very active solvents that come over with the gas and they would not have agreed with PVC at all. That's the first opportunity we would have had to bring it in anyway. When we did bring it in we were doing it very carefully and starting from the outer fringes of the system because naturally the fact that you change that method of manufacture doesn't mean to say there aren't a lot of nasties lying around in the mains that keep coming through for a while, and so we were being very cautious.

RH Was there any affect on when you were bringing in the new type of manufacture – did that have any affect on the cast-iron? Presumably you kept using the cast-iron for a period of time.

LOWE Yes we kept using the cast-iron. No the cast-iron was fine with the catalytic reforming. A little later we got into some difficulties there when we went over to natural gas. All gas utilities had to face up to this problem because the method of joining cast-iron pipes was with a poured lead joint with a hemp liner and with the coal gas it was a very moist gas with all these funny things in it. That would keep the hemp joints expanded nice and tight and would prevent leakage. When the natural gas came it was a completely dry gas. It would remove all the moisture out of that and very quickly leaks would develop. But because we were well aware of this we took precautions and although the problem was with us for a few years we gradually overcame it. That was another good reason of course for making the change to PVC because we had to go to something like that sooner or later.

RH Did you expect to go to natural gas when you changed over to the catalytic reform?

LOWE No, no they hadn't discovered them.

RH Hadn't discovered them.

LOWE No, no they hadn't discovered gas, natural gas at that stage although it followed very quickly afterwards. Looking back on what was happening at that stage it was remarkable how many changes just piled one on top of the other. With the bringing in the catalytically reformed gas we were able to control prices very well and we had a major marketing effort and brought in a lot of extra load. This of course brought up a lot of additional gas mains to be laid and because we were going to PVC we decided to go over to contract main laying and there were plenty of people about who were used to laying PVC pipe and so again our costs tumbled very quickly.

RH Because at that period at the end of the sixties there was a huge boost in the housing development.

LOWE Yes, that was a very convenient time as well because it meant that we had plenty of result from our marketing effort.

RH What happened to the outer – you mentioned Albany and Bunbury had some changes in their [unclear] as well.

LOWE Yes.

RH Did they go to the catalytic reformed as well?

LOWE No with the Albany gas system it was the only other system that we controlled - at the time I took over. And it was again coal-based and in a pretty precarious position and loosing a lot of money I would add.

RH Causing a lot of pollution too.

LOWE And causing a lot of pollution yes. I had to go into that to decide how we ought to attack it. By looking at what had been done in similar situations in Victoria mainly and South Australia to a degree we were able to put forward a proposition that we could take down propane gas, liquid petroleum gas and mix it with a precise amount of air and form a gas which is known as tempered liquid petroleum gas. Which you can calculate to be very close to the burning characteristics of the coal gas that we had been using to minimise the cost of changing over customer's appliances. We having analysed this we decided that was the best way to go forward and we brought this in in 1969.

RH So the propane was tankered down to Albany was it?

LOWE Yes that's right, yes. The Wesfarmers we had a contract with Wesfarmers to do that. It was interesting that the whole of the coal gas system which was you know in large brick buildings with all sorts of mess and things going around it, it was taken over by two large propane cylinders and a couple of little mixers which from memory were about oh 18 inches square and about three feet high. It's an entirely different sort of technology.

You mentioned Bunbury a little while ago. That was a slightly different arrangement and because of our marketing effort that we'd put in we had done a very good sales job on the State Housing Commission. They were virtually every house that could be put over to gas was put over to gas. They were going to put in a big housing group into Bunbury and they came to us and said, "Well, you know, can we make that gas, what's the thought?" So we went into it and found that we could justify going over to a reticulated gas based, again on propane being delivered by tanker. But at this stage, this was in 1972 or '71 more than likely when we were talking about it, natural gas was actually in Perth. So we decided that finally it was quite reasonable that natural gas would reach Bunbury

so the gas we should reticulate into Bunbury to start with we should calculate to be compatible with natural gas so that was done. It's using all the same equipment, it is merely the adjustment of the plant.

RH So they hadn't had any gas in Bunbury before?

LOWE No, no.

RH So is 1971 WA Natural Gas discovered...

LOWE Yes Dongara.

RH Dongara.

LOWE It was Dongara Gas. Yes I suspect I've been getting ahead of myself there.

RH No when I mentioned Dongara that was why.

LOWE We negotiated a gas sales contract with WAPET, WA Petroleum, and they, WAPET built a pipeline from Dongara to Perth. The first natural gas was delivered into our system on the first of December 1971. Of course there was a tremendous amount of work that had to in train by then because we had to convert all the towns gas appliances in the metropolitan area to natural gas. This had to be done in discreet areas which had to be closed off from the towns gas system. And each area took, I think it was about three days, something like that to convert so there was a few people had cold showers for a short time. But the whole thing of course, speed was the essence because it was a horrible business really and we had completed the whole metropolitan area by the 17th June, '71. So what's that? Seven-and-a-half months.

RH It must have cost a lot of money.

LOWE Yes it cost from memory $3 million in those days which although it mightn't sound a lot now it was a lot of money then. Of course in the metropolitan area the Fremantle Gas Company looked after the Fremantle end of that. So it was arranged that they used our contractor for conversion to do their area and similarly they were included in the negotiations for the purchase of natural gas and that's how that was handled. Mind you there was a few very difficult hurdles to cross during that but they were the fundamentals.

RH And what was the split between Fremantle Gas and Coke and SECWA Gas? What areas did Fremantle cover?

LOWE They had an area - and this was laid down up in the 1890s I think it was or the 1880s, the Fremantle Gas had a circle of five miles in radius, radius?

Yes I think it was radius centred on Fremantle that they would look after. In the same legislation that went through Perth Gas Company had five miles centred on Perth but of course as things expanded in Perth we just kept going. There were rules to how you had to do that and they were interesting to do too. We had to deal with each of the local authorities as we went and they had to give us specific permission to extend into their area. While I was there I had several of those to do.

RH Fremantle extends as well then?

LOWE No Fremantle had never extended.

RH They didn't go down to Rockingham and all the....

LOWE No, they stayed within their area. So that was the extent of what had to be converted.

RH And the gas purchaser from is it WA Natural Gas or WANG?

LOWE Yes, WANG, yes.

RH There was a fixed price different to the later one.

LOWE Yes, that was a very interesting contract and I think one of the things it was in our favour was that in Victoria Gas and Fuel had made a fixed price contract with Esso BHP which was, I think unusual. I must admit I had never been involved in those things before so I don't have a lot of experience in what went on then. But we negotiated very very hard to get this fixed price and we finally got it. It turned out to be a real bonus because it wasn't long after the deal had been done that things started to happen in the Middle East and the price of oil started to go up. But of course they had no means of jacking the price of gas up and so we were able to move into the industrial market or small industry more quickly than we would have expected to otherwise.

RH The first crisis was 1972 wasn't it?

LOWE Yes I think it was, yes that's right. You can see we weren't operating very long by then. In fact we were just getting our feet sorted out.

RH So who were your first commercial customers?

LOWE Well the ones we took over initially were a few that we had had previously like the glass works, they were a big customer. In fact that was when they were in East Perth and they were our next door neighbour at the gas works. We picked up a number of galvanising people that was a very popular method

and another one was the malting people in West Perth they were very big customers.

RH Big customers like Alcoa came later did they?

LOWE No the big customers like Alcoa were direct customers of WANG, that was part of the deal.

RH Oh were they, oh.

LOWE Because see they had to have some payback because they paid for the line to come from Dongara to Perth and so their payback for that was they really were selling the lion's share of the gas. We were only getting something like 15 million cubic feet of gas a day from them whereas Alcoa was getting more than that and then on top of Alcoa they had Midland Brick and a couple of others. But of course that sort of thing has to happen or the State would have had to lay the pipeline themselves, paid for the pipeline themselves.

RH So the problem of leakages has been overcome by....You got rid of your cast-iron and it was....

LOWE Well what we did with the leakages, very quickly after we had natural gas right through – that is within months of that we brought in a contractor to survey the whole of our system and pinpoint all the leaks and then we had teams addressing that.

RH How did they locate gas leaks?

LOWE Well they use a fairly light four-wheel drive vehicle – why it needs to be light is it drives along the verge where the gas mains are. And they have very sensitive detectors hanging just above the ground and they just drive slowly along and pick up the gas that way. We took a decision that we would not repair cast-iron joints as a normal situation, we'd rip it out and we'd replace the leaking section with PVC so that you know we were reducing the problem all the time, we weren't perpetuating it. Then for the city, the CBD we decided to bite the bullet there very early in the piece and we ripped all the cast-iron out and replace it with high pressure steel. I think that's the best thing we could have done because there's no point in fiddling with the problem there.

RH You couldn't detect a lot of it anyway because it was paved over.

LOWE That's one of the problems and of course it is so much more dangerous when there are buildings right over it. Although natural gas is lighter than air so it doesn't do what LPG does. With LPG it can flow into a basement and explode. But natural gas will actually vent itself because it is lighter than air. But nevertheless it is not something you take risks with.

RH No.

LOWE Actually I don't know how much cast-iron main there is in the system these days- very likely, very little. But I'm sure they've got it under control.

RH And the actual.... You didn't take over Fremantle Gas and Coke until the eighties was it? That was part of the WA Inc. business.

LOWE That's right. That was another story. I don't know that I'd want to record some of my comments on that.

RH Because they hadn't updated our system as much as SECWA had.

LOWE Yes, that's right, yes. Yes they had done a lot of work there. Mind you I think when SECWA did take them over they found there was an awful lot of work they hadn't done too so it had to be programmed in. But as I say I think that's another story.

RH So I've seen from your notes in 1972 that you got another job different to your Gas Engineer. You became Manager, Gas Head Office.

LOWE Oh yes, what that was was we had expanded at a very rapid rate and it was appropriate that we change the hierarchy of the Gas Department as it was. The terminology was changed and I became Manager, Gas and there was another very senior level underneath me so that we could spread the load a bit. That was what that was about. It didn't really change my responsibilities at all. In fact it helped quite a deal.

RH And during that time or the next few years you subsequently extended the reticulation area was it Pinjarra, Wanneroo?

LOWE Yes that's right. When natural gas came WANG did business directly with Alcoa, as we mentioned earlier, and that included Alcoa in Pinjarra, and so there was a lot of houses to be built there because of Alcoa moving into Pinjarra. That involved Alcoa, private people and the Housing Commission and so again we did a deal down there and had an off-take built in when they were building the pipeline, and we brought natural gas directly into Pinjarra so it didn't have to go through that extended period of operating on simulated natural gas.

RH What about Wanneroo – that was just a natural extension of...

LOWE That was a natural extension, yes. And how we did some of those – in those days private housing developers would jump in and build a whole group of houses fairly remote from services and it would be like a stand alone area. So sometimes those things took off quickly, sometimes they were very slow. So

what we did to avoid costly extension of mains that wouldn't pay for themselves, for a while we would bring in small portable high pressure vessels of propane. We would either distribute simulated natural gas to them directly or sometimes we'd even just distribute the propane gas to them and then do a conversion of their appliances when it was time to connect up. It was all a matter of balancing dollars which was the cheapest.

RH Because some of those areas like Yanchep took years to [unclear] didn't they?

LOWE That's right, yes, yes. You can imagine the costs involved in extending a main out that sort of distance and having nothing on the end of it for quite a long time.

RH So 1975 SECWA became a Commission instead of a....

LOWE Oh yes that was when the Fuel and Power Commission and the State Electricity Commission were combined to form a State Energy Commission. There was quite an upheaval in the hierarchy of the SEC but really that was the major thing that occurred. In that time for certain reasons my position as Manager, Gas was added Electricity and Gas Marketing so I became Manager, Marketing and Gas. That was a very interesting addition because I hadn't been involved in electrical marketing before and it was something different.

END OF TAPE TWO SIDE A

RH The two sides weren't in competition though?

LOWE No, no, they weren't in competition as such because policy was laid down by the Board as it were but nevertheless the Board's view was that wherever loads that had a high peak content like domestic loads were concerned they were far cheaper for the Commission as a whole to meet on gas than they were on electricity. So loads like water heating and cooking and space heating and things like that they are very expensive loads to meet in an electrical system. Both in the distribution system and in the generation so that was the view that was taken there.

RH Under the new arrangements who was the new Commissioner?

LOWE It was Bruce Kirkwood. He took over and Bill Gillies who had been the General Manager of the State Electricity Commission he retired at that stage.

RH I believe you went to Britain some time after to do some, give some papers.

LOWE Yes, yes. I had been on the Board of the Australian Gas Association pretty well from shortly after I became Gas Engineer. I think it was 1968 or something like that I joined the Board. The Australian Gas Association consisted of all the gas utilities and the gas appliance manufacturer's representatives. It was a very interesting group.

RH Did they set the standards?

LOWE Yes, yes, they set the standards and they set their own standards and then worked with the Australian Standard's Association to then incorporate these in Australian standards. Just in the same way as the electricity side of the business operates. But the interesting thing about the Gas Association is it tended to include the whole of the industry rather than the electrical side it really only handled the utilities themselves. It was interesting, particularly over this period where Australia was generally becoming supplied with natural gas in all the various capital cities. Having the appliance people at the board room table was a big advantage and we were able to work together to achieve things that might have been more difficult otherwise.

RH Who made in those days the majority of appliances, were they Australian manufacturers or British or American?

LOWE Most of the common appliances were made in Australia but you know there were importations from both Britain and America and from Europe generally.

RH So was this London visit [unclear]

LOWE Oh yes. I became Deputy President of the Australian Gas Association in '73, '74 and '74, '75 and then became President in 1976 I suppose it was, no '75, '76 I was President. As such it was commonly done that the Australian Gas Association and the British Institution of Gas Engineers worked very closely together and we always sent the president from one organisation to the major conference of the other. And so in my turn I went along to the Institution of Gas Engineer's Conference that year in Britain. But as an additional thing the World Gas Conference they would hold major conferences every, I think it was three or four years and it so happened that 1976 was one of those years and it was held in London. I gave a paper on the Australian Gas Industry at that conference in '76.

RH That must have been interesting?

LOWE It was interesting, yes, yes. It was interesting writing the paper too. It was titled, Natural Gas and the Energy Scene Australia so it was really a background of the Australian gas industry and the things that had happened over those few years which were very torrid years. After all natural gas came to Brisbane to start with and then to Melbourne, then to Adelaide, then to Perth and then to Sydney and all that over a very short period of time. The problems of settling that lot down were quite interesting.

RH So we were quite lucky to learn from the experience of the others [unclear]

LOWE Yes, we were very lucky. And you know this harking back a little bit but when we called tenders for the contractor to convert all the appliances in the metropolitan area the team that won the bid, it was an American company. There were several of them around doing this sort of thing. Stone and Webster – that's right. The timing worked out that they finished the conversion which they were doing in Adelaide and I think their team had about two weeks to get to Perth to start again so this was wonderful. You know normally with those things you are landed with a few experienced operatives and a heap you've got to train. Well these fellows were right on top form, they just moved over and got started. I think we were very lucky.

RH End of 1979 you make another quite a big change from Gas and Electricity Sales to the Manager, Design and Construction.

LOWE Yes, yes that was a little bit different but again it was the circumstances as they were. The person who was Manager, Design and Construction was Sam Clarkson and he was about to retire. The major project that was coming up was the Dampier to Perth Natural Gas Pipeline so I daresay this is one of the reasons why I was given consideration more than others. Other major projects were the Stage C extensions to Muja Power Station – that was

two by 200 megawatt units. The Stage A units at Kwinana the two by 120 megawatt units had to be converted to coal firing. They were originally oil-fired boilers then they were converted to gas firing and now they're being converted to coal firing which was quite an effort. Then the final stage D extensions to Muja Power Station which were again two by 200 megawatt units so there's a lot on. Actually over the, I think it was four or five years we reckoned we had to spend $1 million a day five days of the week for every week of the year to achieve it which was a very interesting exercise.

RH The Dampier to Perth Natural Gas Pipeline was a very big contract or very big undertaking – must have been one of the biggest in the State?

LOWE Yes, yes. I think it was way ahead of anything else at that stage. The project cost was roughly $1,000 million in the dollars of that day which would be a bigger figure now of course.

RH It's still a big figure even now.

LOWE It is still a big figure, yes, that's right. The other point of it was that it had to be achieved in quite a short period of time. Not an unnaturally short period of time but one that we had to keep moving very fast along the track. And it had the other additional problem that we didn't want to spend our money on the pipeline too fast and have the pipeline finished earlier than the gas was ready to go into the pipeline. Because after all as soon as you've got something as big as that finished you expect it to make money. So we were continually keeping in contact with the Woodside people to watch how well they were going and to continually modify our program to fit theirs. So there was a few sudden changes in direction and things like that along the way. But it worked out very well in the end and we finally finished the job. I've forgotten the details but it was something like a month ahead of schedule and somewhat a little bit under budget which we were very pleased about.

RH The actual contract for the gas was on a different sort of set up to the WANG one?

LOWE Yes that's right.

RH Could you explain how it works.

LOWE Yes well I was very much involved in the WANG gas sales contract but I was not directly involved in the Woodside one. My involvement with it really was as head of the gas utility to make it clear what was the best possible specification for the gas. So you know that was a very small part of the business considering the complexity of the negotiations that were gone through.

RH To assist SECWA in the pipeline you had Australian and American consultants. How did you choose who to employ as a consultant on a job like that?

LOWE Yes well we called for expressions of interest from consultants and we had as you can imagine quite a number of contenders. We had to make a decision as to which contender we would use. That is a very difficult selection process because quite unlike a tender for someone to build something there is a final cost. The final cost that a consultant gives you is purely an estimate of how they think the job will go through, and is a guide. But it's not one that you can look at seriously to say, oh well this consultant's price is lower than that consultant so obviously they're better. There's many, many things to look into, particularly their track record on what they have done. And another very very important aspect is who are the people that are going to - that that consultant is going to have in charge of their work and what is the structure of the senior people that they will use. I think in most cases with consultants those sort of things that carry the day as much as anything else. We were very lucky in getting Neville Morrow as the head of Fluor Maunsell and he did a particularly good job. The backup that we got from the company head offices or company officers in Melbourne and in the US was particularly good as well.

RH So actual construction was split into several contracts wasn't it?

LOWE Yes, yes we divided it up into three. We happened to call them, I think it was Stage One, Stage Two and Stage Three, there was nothing special about that. Stage One went from Dampier down to about opposite Carnarvon and then Stage Two was from Carnarvon through to Gingin and Stage Three was from Gingin down to Wagerup. The Gingin to Wagerup bit involved a lot of shall we say built up areas with difficulties. One runs into there, whereas the other ones were wide open spaces with of course their difficulties which were quite different.

RH So who were the contractors who did those three?

LOWE We called tenders for the first section to start with and the ones that won that section were Saipem Australia, they're an Italian based company. They had built quite a number of the gas pipelines in Australia with a very very good track record and they were just finishing a liquids pipeline in South Australia at this time and were doing very well. They were selected from their price and their track record. Then at that time with the gas sales contract that had been negotiated there was a very large 'take or pay' provision. The activities that were central to the whole of the gas business in Western Australia was what to do with this additional gas that was available.

RH So you were talking about the second contract for the Dampier to Wagerup Pipeline and it was something tied up with the gas sales.

LOWE Yes. Part of this push to sell the additional gas that would be available from the pipeline was a possible deal with South Korea whereby they would put in an aluminium smelter or smelter and power station. The power station would be operated on gas. This was being negotiated and the South Koreans put to the government that they as part of the deal they wanted to be one of the successful construction contractors for the pipeline. So finally it was agreed that they would be given the central section of the pipeline, Section Two, from opposite Carnarvon down to Gingin. Because they had no track record at pipeline construction we insisted on an arrangement whereby Saipem would have some sort of control over them in the way they did the work. We paid a small price to Saipem for the work they did in this regard. So the way it ended up was that Saipem had the contract for Section One, the Koreans had Section Two and Saipem had the contract for Section Three. As it turned out they all worked very well. I think it was vital that we had the Saipem people overseeing some of the work of the others. It kept them on the straight and narrow but nevertheless the whole thing did work well. As part of this construction deal we had a team of people with the, that's the Commission and our consultants Fluor Maunsell, went round Australia to talk to various pipeline owners as to how they handled their contracts from the point of view of avoiding strikes and that sort of thing. They collected a lot of interesting information. And so we built into our specification a requirement to have a bonus built in and this bonus stated if the pipeline was finished within oh I've forgotten what it was, a couple of weeks of the stated date this bonus would be paid. If it was finished a couple of weeks or so after that there would be no bonus and if it were every week it was completed ahead of that date the bonus increased. And the increase in the bonus related to something like half of what would be saved by us being that far ahead so we shared that saving with the employees. I don't know whether it was that, I suspect that's what it was that spurred them on but it worked very well. One rather I was going to funny episode – it wasn't funny at the time. I remember there was an emergency meeting called because there was a problem with the Korean team and as we sat down at the meeting the Korean's Chief Engineer said, "We've just sacked all the welders." I nearly fell off my chair. What had gone on was the welders had come forward with – as was the usual thing just when the pipeline was running well they came forward with a huge log of claims and they were going to go out on strike if they didn't get it. The rest of the team except for the welders they could see themselves losing their bonus and so they came to the Korean Management and said, "If you don't sack all those welders so that we can get on with the job and get our bonus we'll all go on strike." So all the welders were duly sacked and a new team wheeled in. The production was down for a couple of weeks but then they caught up and passed the previous exercise so it all worked very well from that point of view. So there's more than one way of doing these things.

RH Yes I suppose by that time there was quite a lot of experience in pipeline welding in Australia so you could bring in a second team.

LOWE Yes it wasn't quite as difficult as it would have been some time previously, yes.

RH So the weather played quite a good part in that didn't it at the time of the contracts - in relation to the weather there were no cyclones or anything?

LOWE No, we were very fortunate in that regard. I think it was the year before there was a cyclone came through which caused quite an amount of flooding and people from the consultants were flown up there to see just what happened under these circumstances so that we could be at least prepared to some degree for what we could do. But as it happened it was a dream run from a weather point of view. Mind you it caught up the next winter or next rainy season when we were working on compressor stations. There was one compressor station crew that were totally isolated for a couple of weeks and we had to fly them out by helicopter when they ran out of food so these things happen.

RH As long as the station wasn't flooded?

LOWE No, no it was all right.

RH So as far the power station work's concerned there was a lot going on at the same time then?

LOWE Yes.

RH You had extensions to Muja and also the work, the conversion at Kwinana.

LOWE That's right. Because there was so much going on and we were handling different contracts in different ways in the power station in 1981 which was virtually the peak of this work there was a change in the way the jobs were handled. My position was altered to be Chief Manager, Power Projects so that I was in charge of all the power projects, as I had been before. But I didn't get involved with the Commission's Design Team because in some of the power station work we did the design work in-house. But I was in charge of the design side of it where we used consultants for that work which included the pipeline and the Kwinana Power Station A, yes, and the gas laterals they were all handled separately. So this helped a great deal and it was a much easier team to look after or number of teams. So in effect I had one team looking after Muja, another team looking after Kwinana, another team looking after gas supply laterals that weren't part of the main supply line. Then the main Dampier to Perth pipeline group.

RH By that time it was pretty well complete the pipeline in '82 was it?

LOWE Yes well it was getting on. Actually we commissioned the pipeline in '84, August '84. Actually it was our wedding anniversary when the gas first flowed in. I'm afraid I didn't get home that night for quite a while on account of the - when the Woodside people had finished their commissioning it was, oh I've forgotten about 7.00 o'clock, something like that, and they said, "Well we finished ours, we are in a position to send gas through if you want to take it." The immediate response was, "Oh well how about if we leave it till the morning?" And I said "No way in the world, you'll start right now." There was not going to be any break in this commissioning. So off we went. So it was just 24 hours a day then for, I think it was something like 10 days when the gas got down to the first customer commissioning was the Wagerup Aluminium Refinery of Alcoa's and I think that was something like 10 days afterwards.

RH So the supply laterals to customers who were lined up later after pipeline had been built.

LOWE Yes that's right. Well see in this case it was the Commission who were building the pipeline and paying for it, not like it was with WANG and so we took all the customers whether they were big or small. Alcoa of course had grown considerably since the days of the WANG pipeline so they were again taking the lions share of the gas but we had many other customers that had to be connected like the Wagerup Refinery. There's another one and the Nickel Refinery and all a great raft of brickworks and people like that that we had to connect up.

RH Wasn't there some trouble with Wagyl somewhere around the laterals?

LOWE Yes that was rather later. When we were bringing the gas through we had to get a lateral into Perth naturally to supply the centre of the city and there was a problem with the Wagyl to in crossing over one of the creeks. I've forgotten which one it was now. Everything was very tight as far as scheduling was concerned so we just didn't bother to proceed we just diverted and we went in a different direction. It wasn't a big deal. Instead of laying in a very high pressure major lateral into the city we laid a medium pressure main in which was very adequate for the next number of years. We fixed it that way then came back on the job. I think it was a couple of years later before it was finally overcome and laid but it had no affect at all on the program for distributing the natural gas.

RH The conversion of the units at Kwinana must have been fairly complicated considering it's already been through two conversions.

LOWE Yes, yes, it was. It ended up a very interesting power station because I think at the time we completed it it was the first power station in the

world that was able to operate automatically under automatic control on either coal, oil or gas at the press of a button. In consequence we had visitors from many parts of the world wanting to come and have a look and talk about and that sort of thing. It was quite an achievement.

RH Is there a likelihood it might go back to gas or....?

LOWE Yes well it went as soon as the pipeline was finished it went very quickly onto all gas firing because you know that was what we were trying to achieve to reduce this 'take or pay' exercise. So we burnt a lot of gas there at that stage. As time went by we also had coal contracts and so they had provisions which had to be balanced and so it became a very useful station from that point of view that we were able to get the best out of our contracts by balancing the burning of coal or gas. Of course the burning of gas at Kwinana became less important as the number of gas turbines we had installed elsewhere increased. That took place a few years after the gas pipeline was completed.

RH So down at Muja you were doing the last two stages. Were they C and D?

LOWE Yes that's right. The Stage C had been negotiated and the contract placed before I was involved and the contractors were CA Parsons for the turbines and International Combustion, I think it was, yes for the boilers. When it came to advertising tenders for Stage D which we wanted a repeat of Stage C the Japanese turbine people became interested. And the stories around the traps which of course are always interesting was that the Japanese said that they were going to get the contract, that was it, and whatever price was necessary they were going to get it. So it was a very interesting exercise and I suspect we got very cheap turbines there. The Parsons people they tried very hard with all sorts of subsidies and things from the British government but they couldn't get within cooee of the price that the Japanese had put forward. So the Japanese got what they said they were going to get, the contract.

RH But it was the last one in the actual Muja Power Station itself?

LOWE Yes the last two, the last contract, the last two machines.

RH There was still another Muja Power Station to be built later on though?

LOWE No, no this was...

RH Oh the Collie one.

LOWE Yes the Collie one, that's right, yes. That's the one that they will be commissioning it right now I think or very closely now.

RH So in the April 1985 you became Chief Manager of Projects, Special Projects after being that time in the power project.

LOWE Yes, that's right.

RH I think we'll discuss that on the next tape.

LOWE Yes, yes. It was a very convenient thing to come in at that stage when I had mainly finished all these other things and I suppose theoretically I should have been at a bit of a loose end but it wasn't to be.

RH We'll continue this afternoon on the 14th August on the third session of talking with Peter Lowe about his life and career.

We were talking Peter about the cost of new equipment for power stations and you were saying it's a combination of two things.

LOWE Yes the total cost of a unit in a power station naturally consists of how much it cost to buy the thing, how much it costs to maintain it over the years and how much it costs to fuel it over the years. So you are looking at efficiency levels of the plant and the complexities or whatever of the maintenance of the plant. One of the tools that one has to analyse a tender is to calculate a total cost of operating that unit under the load pattern that has been assumed for it for the period, a reasonable period of its life, say 20 years. Then looking at what that total cost is from one contractor to another contractor. That's I think a very complete analysis for the unit.

RH So when you had finished the Muja C and D and also the conversion at Kwinana you became Chief Manager of Special Projects. Was that taking you away from the power generation?

LOWE Yes really at that stage the pipeline was finished and the power stations were finished. And, it as a coincidence, Bruce Kirkwood who was our Commissioner happened to be Chairman of the Electricity Supply Association at the time and as such was also Chairman of the Australian Division of the World Energy Conference which is a group that ties together all energy related conferences and things around the world. The proposal from the World Energy Conference was that they would like to have a Regional Energy Conference held in Perth. Seeing as I'd finished all these things and looked as if I was at a loose end I suppose I was taken out of projects and given that job to do.

RH Was this something new a Regional Convention?

LOWE Yes.

RH Or did they used to have a global one previously before that?

LOWE Yes that's right, the conferences that they'd had previously were every, I think it was three years, something like that there'd be a World Energy Conference.

END OF TAPE TWO SIDE B

LOWE .... No doubt that is where they got their name from and it was just held in a different part of the world every three years or whatever it was. But then they decided that rather than having these major projects and waiting so long in-between - and the energy business was changing so fast they thought they ought to have something different and they branched out into a number of smaller specialised units. But the one they had in mind for our area was this Regional World Energy Conference.

RH So was that a South East Asia mainly or did it include the what they call the Pacific Rim countries now?

LOWE Yes it was quite a big area with a huge population that we were selecting from. The countries we were given were Australia, Indonesia, Malaysia, Singapore, Thailand, Taiwan, China, Japan, Canada and the US. I haven't added it up but I should imagine that's darn nearly half the world's population. Oh and New Zealand I'm sorry, was added to that.

RH So you had China and Taiwan at the same conference that must have been rather tricky?

LOWE Yes, yes. That was a very interesting exercise. It was a fight from beginning to end. It resulted in Taiwan supplying all their papers for the conference but they did not come along to present their papers. It was made so difficult for them by China.

RH And did the Department of Foreign Affairs sort of brief you on how to deal with the two of them?

LOWE Yes. I was briefed by the Department of Foreign Affairs on the whole exercise and things that we ought to be considering and I think 99 percent of it was how to handle China and Taiwan. There's no magic formula I can tell you.

RH No. The Taiwanese didn't turn up in the end?

LOWE No, no they didn't turn up but they put forward some very interesting papers because they were moving very quickly at the time and their electricity generation of course in a comparatively small island like that without many resources is a real problem. They had some very interesting engineering thoughts.

RH So there was a big range in development strategies I guess from the US right the way through to Thailand and [unclear]....it must have been interesting.

LOWE Yes that's right. In setting up the conference we had to set up the areas of energy that we wanted to refer to. I'd forgotten how many sections there were but more than likely five or something like that. Then we had to break down sub-groups within each one of those and then we went out with a letter to each country in that list asking them to nominate papers within these topics. Each paper had to have a precis developed and be into us within a certain period of time. Then we had to go through all these papers and try and devise a program that would give each country a reasonable exposure to the papers they were giving across as wide a band as you could expect that particular country to give and give their particular specialities as much emphasis as possible. So it was a very interesting exercise to do that.

RH Were there any cases of a country wanting to talk about something that you hadn't recently thought of?

LOWE I don't recall anything like that, no. I think we were aware of most things that were coming through.

RH It covers every aspect of energy?

LOWE Yes it was a very broad conference. We ran three streams at once for the whole of the period so that was the only way we could get through the number of papers.

RH And what sort of executive committee did you have to organise to do this? Were there people from other countries as well?

LOWE In the decision as to how the conference was to be run to get approval for the types of energy operation that we were going to discuss at the conference all that was fed through the London Office and we had to have approval from there. But as soon as those outlines were laid down the approval was entirely within the Australian Committee, and we had an executive committee of, I think it was about five or six and we usually met in Sydney, either Sydney or Canberra. But of course being an Australian group like that there was an awful lot of chit chat went on on the phone and things were sorted out that way more often than not. I think we only met about four times in the whole process.

RH And it was all in English was it or were there other official languages?

LOWE Yes it was all in English so we didn't have to get involved with immediate translators and things like that.

RH I think in that year you also went to London to do a paper on something?

LOWE Yes at the end of the World Energy Conference luckily its date fitted in very well. I then took some leave and went to London and went to the Institution of Gas Engineers Conference over there and gave a paper on Design and Construction of the Natural Gas Pipeline.

RH That was basically for a British Institution?

LOWE Yes that's right, yes. It was their annual conference, it was held at Torquay.

RH And did it often have national or commonwealth engineers giving papers?

LOWE Yes they always have three or four shall we say non-UK papers. Naturally the majority of the papers are from the UK area. But then you know I was a fellow of the Institution of Gas Engineers anyway so it wasn't unusual.

RH At that time gas industry was being privatised in Britain [unclear]

LOWE No it still hadn't been privatised at that stage but it was getting very close. I don't think it had. If it had it just happened. It was one side or the other of that.

RH So you've got your British colleagues comments on that side of things.

LOWE Yes, yes it was interesting from their point of view because of course the majority of people were there who were there were from UK or Europe and the distances involved were something they had never been involved in.

RH Even the big pipeline jobs in England are small by Australian standards.

LOWE Yes, yes they are. But of course they are also terribly difficult too so you win in one area and you lose in another.

RH I believe you also went to India that year?

LOWE Yes this was again to do with this 'take or pay' gas. There was all sorts of possibilities looked at. One of them was the prospect of doing a deal with India whereby a power station would be constructed right down near the southern tip of India which would be supplied by Western Australian coal. Because if we could sell some of the coal off that would allow us to use a lot more of the gas in the power stations. Although I wasn't involved in any depth in

the discussions later on I was the one that went up there to have a look around and collect ideas and meet people as the first one into the country. Again that was particularly interesting.

RH Was it a feasible proposition as far as Western Australia was concerned?

LOWE It was quite feasible. The difficulty was that India was just too difficult to deal with. Any imports or any approvals to do business outside the country was just too complicated. I think that's where it fell down.

RH I think they've been rationalised matters of bureaucracy now that as far as dealing in India.

LOWE Yes I've heard that said quite a bit in the last couple of years that things are better now. All I can say is they'd need to be because they were starting from a very low base.

RH And did you visit any of the power stations there?

LOWE Yes I visited two of them. One was down more or less in the area where this new power station would have been built – that's on the Eastern Coast of India just about opposite where Sri Lanka is. The power station there was a Russian design, I'd never seen that type of plant before. They were 200 megawatt units. The power station was very very well run and as clean as I've ever seen power stations. The people who were running it were terribly keen. Myself and another fellow who we were doing the looking around we visited them of a Saturday afternoon and the engineer in charge wheeled the whole of his senior staff in for the whole of the Saturday afternoon to talk to us. So it was very very well done, I was most impressed.

RH Did they have Russian equipment?

LOWE Yes, yes, yes. All the turbines and boilers was all Russian. The other power station I looked at was just outside Madras and that was absolutely the other extreme, I've never seen anything as dirty and as badly run. I was amazed. You wouldn't have thought that two such things could exist in the same country.

RH What sort of equipment did they use there?

LOWE I think that it was older equipment, I think it was of UK origin. But not that that was anything to do with the way the power station was run or its run down nature. I was intrigued as we were walking round the site and the induced draught fans of course are outside the boiler structure on the ground. Beside each induced draught fan was a new fan runner. I said to the fellow, "What's that

there for?" And apparently there's so much grit coming through the boilers that they have to change the runners so often they just keep them beside the unit. They don't bother to put them in the store.

RH Oh gosh. And who ran the power generation in India – is it run on a State basis or is it run by centralised....?

LOWE Well both actually. We were dealing with the State part of it and it was set up somewhat similarly to a government department I think you'd say. They were there to operate the electricity system. Now there was a shall we say a federal set up as well that was run by the New Delhi Central Group and they called the power stations that they built – they were super power stations. At that stage they were made up usually of four 500 megawatt units in each station. I don't know what the requirements were for them to go into a State and build one of these but there was requirement. We had both type of... both organisations were involved.

RH And you were dealing with the State one, State organisation?

LOWE That's right, yes.

RH I think you also went to Bulgaria about that time is that....

LOWE Yes the Bulgaria bit was before the World Energy Conference and it was to a World Energy Conference Executive Meeting so that all countries who were members of the World Energy Conference their Executive would meet every year. And so I went over there with Bruce Kirkwood and two or three others. It was necessary for Bruce Kirkwood to address the conference and tell them exactly what we were doing with the regional conference and inviting people to attend. We took advantage of the opportunity of seeing the executives of all the countries who we were involved with to convince them that they should send quite a number of people to the conference so it was a useful tool.

RH Did you see any power generating in Bulgaria?

LOWE Yes, yes. There were a number of post conference tours and the one I selected involved going over a nuclear power station on the Volga and that was interesting. There was an operating station of four units. I think they were something like 350 or 400 megawatts each unit that sort of order. Then there were two units being built and I think they were more than likely 500 megawatts or perhaps 750 megawatts for each unit. They were big ones. It was a Russian was the Chief Project Engineer and he impressed us all as being quite a brilliant fellow but we weren't impressed with their method of putting a nuclear power station together. They don't have, or in this particular case they did not have a second containment vessel. The inside containment vessel of steel and then usually around that you have a reinforced concrete containment vessel. The

reinforced concrete is very thick and it's there as a protection from the radiation. But also of course if it is poured in a manner that is capable of taking pressure then it's a containment vessel as well. But the Russians said, oh no they could save a lot of time just by stacking pre-cast concrete blocks around it. Of course that gave you the radiation protection but no pressure.

RH Was that before Chernobyl or not?

LOWE Yes that's right it was quite a number of years before it. I don't know whether the Chernobyl one was built in that way or not. Although from what I understood I don't think they had a second pressure vessel around Chernobyl.

RH So was nuclear energy ever considered in Western Australia?

LOWE Yes it was.... The Energy Commission always plotted forward with plans that would see the load being catered for for say 10 years, 20 years along the track. It was usually done in such a way that these plans would contain the possibility of using different fuels because of course you never knew which fuel was going to be the cheapest. So we had these plans prepared and we also planned for nuclear power stations. That planning of course didn't go any further than getting actually buying remote sites so that should it occur we had somewhere to put it. There was no necessity for it progress beyond that.

RH Where were the planned sites?

LOWE There was one north of Perth, that was the major one, which has since been sold from memory. There was another one somewhere between Perth and Bunbury from memory. I never saw much of them I wasn't involved except on the outskirts.

RH Apart from the political ramifications did you think nuclear power is an option for Australia?

LOWE Well I believe it is. But of course you've got to get all the things right. Firstly it's got to be cost effective as well as safe. With the amount of coal that we have over in the Eastern States the coal is likely to be the preferred fuel for many many years to come. Of course there's all the arguments about the greenhouse gases and if someone wanted to put a price on reducing those – which of course could happen because they're already discussing the allocation of greenhouse gas permits and that these might be sold.

RH They are transferable aren't they?

LOWE Transferable and that sort of thing. So if those sort of prices go up then other means which includes nuclear energy could well become an attractive proposition.

One thing is harking back to Bulgaria we having gone over this power station, I mentioned there were four smaller units and I was rather horrified to find out what was it about eight or nine years later when after Chernobyl there was a world-wide body formed to look at nuclear power stations around the world and pull them into line. One of the first power stations they said had to be shut down as quick as possible was the one I'd gone over. Good we don't know all these things at the time isn't it.

RH Yes. So after your year from '85 to '86 you changed hats again and became Assistant Commissioner for Generation. They put you back in the firing line for...

LOWE Yes that's right, yes after that little pause which was a very interesting little pause.

RH What was the major problems when you first went back into generation?

LOWE Well I still retained the responsibility for design and construction of new plant. At that time we drew up specifications for eleven 36 megawatt gas turbines because of course the emphasis was on gas at this stage and they were to be installed progressively at three sites. Mungara which is near Geraldton, Kalgoorlie - although that wasn't gas fired that was an oil fired one, and then mainly at Pinjar which is a little north of Perth. That was the major construction type of job that was on.

RH How many megawatts were they as units?

LOWE Well each one was 36 megawatts but there was a multiple number of them. I can't remember, I think it was something like four of them went in at Mungara, one went in at Kalgoorlie because there was already one up there and the rest of the them went into Pinjar. Then at that same time the Kwinana Power Station Stage A and B units were modified to burn gas. Now it's a changing fuel world and we then reached the stage where at the press of a button we could burn either gas or coal or oil on automatic control which is I believe was the first largish power station in the world to do that. We had quite a number of people come from different parts of the world to have a look at it.

RH So when you changed the ones from oil firing to gas firing you didn't actually rule out the use of coal?

LOWE Oh no, no, no all that was retained.

RH And also you kept the oil firing option as well?

LOWE Yes, yes. It's not what you'd use for any length of time because it's too expensive but those sort of things if they're available it's an extra string to the bow isn't it, under times of emergency. Then the other, from the design and construction side is we prepared preliminary designs for the next power station that we saw would be a separate one in the Collie area working in the same way as Muja does on local coal delivered by conveyor and with cooling towers.

RH So you didn't have to use the river or things like that

LOWE No, no entirely separate, it was from underground water. We had some very big bore fields there and also we accepted water that was pumped out of mines as well.

RH So where did the water come from for the previous ones?

LOWE In the same sort of thing at Muja. It always was bore fields.

RH Yes. You didn't have cooling towers?

LOWE Yes cooling towers but the water for the cooling towers was from there. For the initial units at Muja we also had negotiated to have an allocation of water from Wellington Dam and a pipeline was run from Wellington Dam to there. It was rarely used because once we were set up the price went up considerably and we found we could get our own from bore fields a lot cheaper. And it turned out that the quality of water we got from the bore fields was a long way ahead of the quality of the water from Wellington Dam.

RH The Wellington Dam was too saline.

LOWE Yes that's right. Which when you're running a cooling tower is terribly important because whatever is in there you are going to concentrate quite quickly.

RH So did you have to treat the water as well?

LOWE Yes.

RH Isn't there a hydro-electric unit at Wellington Dam? Is that still used?

LOWE I don't know whether it is still used now, I think it still is. Actually I was involved in its construction back in the early fifties and it's a tiny little thing, it's two megawatts. There were some moments of panic there when we were constructing it and there was a major flow of water over the dam and the water rose up around there. We had to hook the alternator on the crane and lift it up out of the water. There were some difficult times for a little while.

RH Oh because the dam itself overflowed?

LOWE Yes it overflowed. I think it got up to more than two feet coming over the top.

RH So that was the first one in the State there?

LOWE Yes. Well if you don't count there's a tiny little one at Pemberton that was run by a private contractor down there. You might have heard of that one.

RH No I didn't know that.

LOWE It was run on a wood-stave pipeline and it gave electricity to the town of Pemberton for many years.

RH Gee, I didn't know that no.

LOWE They told me that the pipe looked like a sprinkler system but nevertheless it still all worked.

RH So that time you hadn't decided whether the Collie Power Station was going to a private one or any variations of private enterprise [unclear]

LOWE No that's right. Well see those things were always open. The important thing was to establish the design and a rough idea of cost structures and then when it comes to calling tenders then you can call tenders in those different ways and then compare the result.

RH Well to come back to the hydro scheme again you were also involved with the Ord Hydro Scheme and also a smaller one on.... Was that on a diversion dam?

LOWE Yes, on the Ord River diversion dam, yes Bandicoot Bar.

RH [unclear]

LOWE Well what that was all about was Argyle Diamonds were setting up and they had a need for an amount of electricity and so through consultants through Snowy Mountain Authority we prepared designs and costing to see what the price would be to generate quite a significant amount of power. I think it was two 15 megawatt units at the Ord Dam, and that would have looked at supplying Argyle Diamonds and then down to Kununurra and on to Wyndham.

RH That always had been thought of hadn't it when the actual dam was built [unclear] hydro on it.

LOWE Yes, yes. Provision had been made to a degree and it was just necessary that we check all these things and see what else had to be done. It was going to be necessary to change the bi-wash arrangements there in some manner. I can't quite recall what it was at the moment but that was a significant change that had to be made. Then with a different consultant we looked at building a smaller unit on the Bandicoot Bar. The logic there was if Argyle Diamonds were not interested then the whole thing had to be scaled right down and you certainly couldn't afford to generate that sort of electricity on the Ord main dam. So the view was to see what the costs would be. If we had a small unit at Bandicoot Bar and just supply Kununurra and Wyndham. So those costs were run out.

RH So in the end neither was built at that time but later on the hydro power station at the Ord was built.

LOWE Yes, has gone ahead with private enterprise. The decision that Argyle Diamonds made from memory which I thought was the sort of decision I would have made too I could quite see why they were concerned. They put in a bank of high speed diesels which are not an expensive unit to put in. But it would carry them through for a few years so that they could test the viability of the project that they were on and then look for something far more permanent.

RH They're the sort of things that the mining companies do normally put into [unclear]

LOWE It is, yes, yes because you know they can be quite short term can't they? And you wouldn't want to be spending many millions of dollars on large equipment and then suddenly find it had nowhere to go.

RH When later on Argyle decided they could afford to have a – or the scale of work could justify it.

LOWE Yes I assume that was the case. I wasn't involved in that time but to me it appears quite the logical way to go.

RH So another thing you were also involved at Muja Power Station then "A Plant Life Extension" – what was that?

LOWE Oh yes as Assistant Commissioner Generation I was not only responsible for the design and construction of new plant but of the operation of the existing plant. Muja A and B units, the first units had been in operation quite a number of years, I suppose, well more than ten. It was an opportunity to bring in a consultant to go right through the plant and prepare a report on what could be

done at a reasonable cost to update that plant and make it, put it into a condition that it would extend its life for say another ten years and that was done. And it's not a matter of shutting all the plant down and doing this investigation all at once, of course the consultants had to fall in with our maintenance periods and do their work in conjunction with what our people, our maintenance people were doing.

RH What sort of thing was involved – was that to do control systems or was it actually work on the units themselves?

LOWE A lot of it was control systems because there had been such huge changes take place in that area. But other things like in the boilers, the super heater tubes for instance they are under the greatest thermal strain so they had to be checked through to see what life was left in those and anything should be done to assist them. The turbines to check the blading on the turbines to see how the wear was going there and anything that needed to be done. Those sort of things.

RH So what is the life of large units in power stations without that sort of thing it would be 10 to 15 years would it?

LOWE No you would normally expect to get 20 years out I guess. But we always managed to get quite a lot more than that by squeezing them a bit. Of course as plant gets older the tendency is for it to be left behind from an efficiency point of view because technology has progressed and more modern plant is much more efficient. So it's not that it won't work but it won't work in a cost effective manner. So this life extension was aimed at not only keeping it working but having it working in a cost effective manner.

RH So be able to compete cost-wise with units that were actually put in at that time.

LOWE Yes, that's right because naturally when we run units in the various power stations to meet the load of the time the units that can produce electricity at the cheapest price they come on first and off last and then moving down to the other end. So the efficiency is terribly important.

RH And also you were looking at alternative energy systems at the State Energy at that time.

LOWE Yes.

RH Mainly wind power or with other things as well?

LOWE Oh there were quite a number of other things and this had been going for many years, 10 or 15 years. But it culminated in at this stage with the

wind farming going in at Esperance – where if you've been to Esperance you'll realise why you put a wind farm there.

RH Perfect place for one.

LOWE Yes. These were six 60 kilowatt units there, quite comparatively small. At this stage the Commonwealth were interested in getting operating information, costings and such things on wind farms. We managed to get a grant whereby the SEC paid an amount and the Commonwealth paid an amount for these six units. The amount we paid was the amount that we could afford to pay for the amount of generation we would get from it compared with providing that generation in diesels, and the Commonwealth filled up the rest. From our point of view it was just the same as putting in another diesel engine.

RH I believe there's a second wind farm been put in subsequently?

LOWE Yes, yes. Those units are bigger and they are much easier to operate. With one of the problems we proved very quickly with the first units that went in was their maintenance was fairly high. That has been overcome with the second lot.

RH The first lot was the first actual wind farm in Australia was that one.

LOWE Yes it was, it was the first commercial size wind farm.

RH Because there were some on Rottnest weren't there at one stage?

LOWE Yes we had two at Rottnest and we also had one near South Fremantle Power Station. They'd been around but this was a commercial sized one at Esperance.

RH The main saving was in the less diesel used.

LOWE Yes, that's right, yes. That was why it was put down in Esperance whereas if we'd wanted to connect that to the interconnected system then the calculation from a cost point of view would have been entirely different.

END OF TAPE THREE SIDE A

RH So you can't use wind generation as an adjunct normally unless it's a very unusual place and it has a special grant.

LOWE Yes well the costs have to be right and on any big interconnected system it is highly unlikely that they would be right. In America where they have quite large wind farms in various places when you look into them you find that that's all taxation related.

RH Oh is it, oh.

LOWE It's conservation of dollars that one looks at not anything else.

RH What about solar power. There must be an awful lot of solar power on houses – what about for larger uses?

LOWE Well we had an agreement many years ago with a German Company and we installed a unit at Meekatharra associated with the diesel power station down there. These were solar arrays that were tracking, they would follow the sun around. They were used to heat a fluid which went through a turbine just like reverse operation of your refrigerator and the fluid would be condensed the other side and then go out to the solar farm and be heated again and come back again. But it wasn't effective and finally it was removed.

RH Because they do have solar farms in America don't they? I suppose that's just another same sort of thing they have a tax of advantage for it.

LOWE Yes that's right, yes. I should imagine that's the case. I know the ones that you're referring to but I don't know whether they....

RH Colorado, I think isn't it?

LOWE Yes, I think it is, yes. Well the Western Power has units at Kalbarri that are.... They're the thermal electric ones where you are converting directly from silicon panels into electricity. I don't know how they are going.

RH It seems to create a potential for in remote sites and then inland areas for solar power isn't it?

LOWE Yes, well it's as I said before it's a matter of adding up the costs and of course costs for other forms of generation when you get into remote areas is very high.

RH What about tidal power – I believe there is a scheme in Derby at the moment. And there used to be a larger one was [unclear] French [unclear] consultants did one proposal didn't they?

LOWE Yes. Yes that was done at one stage. The construction costs and period of construction was such that the amount of capital that would be outlaid for the period would have created such a bill that you'd never have recovered from it. That was the first calculation I don't know how different it is now. But of course it's so remote that it would have to be in association with some major industry like an aluminium smelter or something like that to use up the energy.

RH I suppose there was a time – I was thinking about the Mitchell Plateau of bauxite.

LOWE That was the time, yes, yes.

RH Well what is this small one at Derby how does.... That's a commercial one isn't it?

LOWE I believe so. I don't know anything about that at this stage except what I've seen in the press from time to time.

RH And the last thing you mentioned in your notes was about increasing the availability factor in generating plant. What do you mean by that exactly?

LOWE Yes well this comes back directly to the operating side of power stations and the effectiveness of a generating unit is gauged in various ways. One is the efficiency that it can convert coal or the fuel or whatever it is into electricity. The other thing is how long throughout one year it is able to operate on load and on full load. That's called the availability factor so you can imagine if you had a 200 megawatt unit and it was only available say for three quarters of the year it would be a much more expensive proposition to one which was available for 95 percent of the year.

RH What would cause it not to be available – breakdowns or maintenance or something like that?

LOWE Yes, maintenance and breakdowns, yes. So it's a very interesting exercise and completely comprehensive when you're chasing up availability factor you're looking at virtually everything. To my way of thinking it is a gauge to the efficiency of the power station maintenance and operating people and if they can achieve a very high availability factor then you can be fairly sure that they're a very efficient group. It's not one of those things you can just go to one or two factors and say oh you know that's where you look, you don't you look everywhere.

RH I suppose the older plant is more difficult to get a high availability factor [unclear]

LOWE Yes, certainly, yes, yes.

RH So we're coming up to the time you retired and that was in March 1988. Had you reached retirement age or you just decided that would be a suitable time to....

LOWE Well I had reached the age when I could retire but not the age I had to retire. Actually I was going to retire on the 1st of April because I got my first promotion 40 years before or something like that on the 1st April and I thought that would be appropriate....

RH April Fool's Day.

LOWE Yes. But it turned out that the 1st of April I think was Good Friday so I couldn't retire then, I had to do it the day before.

RH So what made you decide it was a suitable time rather than the date?

LOWE Well I think what made me decide it was a suitable time is that all the major things that I'd been involved with had either been concluded or they were set up and running and I thought that was a good time to stop.

RH Looking back over your career you were very happy you became a Power Engineer?

LOWE Yes I think so. Mind you these things are very difficult to get too dogmatic about aren't they because you know if I hadn't done that what would I have done and one doesn't know. At important times in your life the direction you go in changes and well you make a decision whether you go that way or the other way. It's always very difficult to go back afterwards and say well what if?

RH You had a good variety of different work inside the same organisation though.

LOWE Yes I was very lucky that way that the SEC that I went into was such a broad organisation. I didn't have to go to other companies to get that experience.

RH Do you think young engineers these days will find it more difficult to get that range because when the power authorities become more privatised they might find one organisation has a speciality one side and only deals with that particular side.

LOWE I rather suspect the tendency is going to specialisation and I think yes it would be more difficult to move around as much. I think looking back I was a generalist not a specialist. I think there are a lot more specialists these days.

RH So what do you plan to do with your retirement?

LOWE Well try and do the sort of things that I haven't been able to do up to that time. I was looking for a complete change, and although the thoughts one gets don't always happen of course but certainly I wasn't keen on going on with engineering to any great extent.

RH Well thank you very much for talking to me Peter, it's been very interesting and I'm sure this has been a very valuable insight into the power generation and the career of power engineers over the last 40 years.

LOWE Yes, thank you very much Richard, I've enjoyed it too because when you start talking about these things you start reliving some of the things that occurred and that's always interesting. Thank you.

END OF INTERVIEW